PUBLISHED BY SCHOLASTIC INC.

JUNE 1984

VOLUME 2
NUMBER 6

$1.95

INTRODUCING Apple IIc...

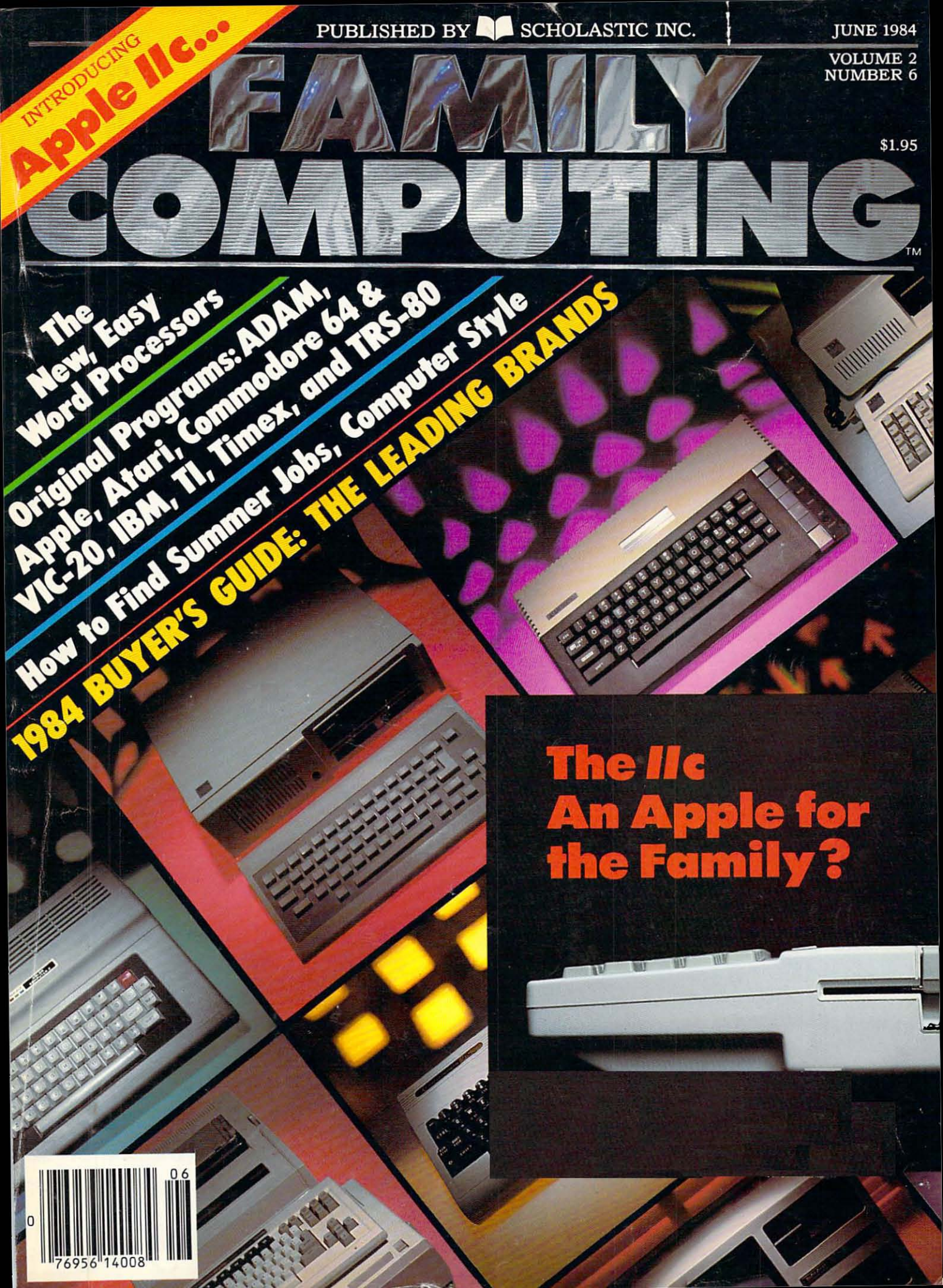
FAMILY COMPUTING™

The New, Easy Word Processors

Original Programs: ADAM, Apple, Atari, Commodore 64 & VIC-20, IBM, TI, Timex, and TRS-80

How to Find Summer Jobs, Computer Style

1984 BUYER'S GUIDE: THE LEADING BRANDS



The *IIc* An Apple for the Family?

0 76956 14008 06

HOW TO PICK A PRINTER:
(A survivor's guide.)

WRITE DOWN WHAT YOU NEED ONE FOR IN THE FIRST PLACE.
And then the second place. And third place (Letters to customers, newsletters, financial reports, etc.).
In other words, set down your priorities, in black and white—which will go a long way toward keeping you out of the red. Because the price of a printer is almost directly proportional first to the quality of its printing, and second to how fast it prints.

THERE ARE TWO KINDS OF PRINTERS IN THIS WORLD. CHOOSE ONE.
Either "letter-quality," which gives you text that you can't tell from hand-typed copy . . . or "dot-matrix," which, with a C. Itoh printer, looks like this. (Most other dot-matrix, or "business printers" have a far flimsier dot pattern, and give you copy that looks like a bad job of spray painting.) The former is for formal: reports to clients, final drafts of boilerplate, contracts, or letters to the President.
It prints with easily available "daisy wheels," similar to those on many typewriters. It's the "show" part of Show and Tell and its price reflects it.
Letter-quality printers generally cost about a grand more than their dot-matrix counterpart. Dot-matrix printers are made for the "tell" functions: things like financial data, interoffice memos, authors' first drafts, or "dumping" a bunch of programming data onto hard copy for reference or de-bugging.
Not fancy, but functional. And, comparatively, cheap.

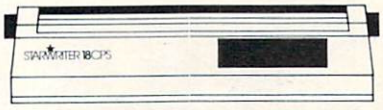
FIGURE OUT HOW FAST YOU NEED WHAT.
Because the higher the speed, the higher the price—typically several hundred bucks per significant speed jump. (About speed: It's measured in "cps," or "characters per second.") A standard business letter contains about 1,000 characters. So, at 18 cps, it takes about a page per minute to print.
Therefore, you have to ask yourself if it's worth an extra $500 to double the speed with another letter-quality printer. If you churn out lots of copy, the answer is probably yes; if you grind out only a dozen letters a day, it's probably no.

UNDERSTAND THIS: WITH ANY BRAND OF PRINTER, YOU GET WHAT YOU PAY FOR.
If you buy a Brand-X printer for $1,000, it's going to be better or faster or somehow gooder than the same brand that costs $500.
In the case of the C. Itoh line of printers, the same holds true. Even though we promise that at every price point you're getting the very highest value for the very lowest buck. By a long shot.
And that's a gross understatement.

BEWARE THE BRAND, THE WARRANTY, AND THE SERVICE.
No printer is perfect. (At least not forever.)
Which is why most other brands come with a 90-day warranty, a service policy that requires a lawyer, and a repair department in Des Moines or someplace.
Nor do we claim perfection. But every C. Itoh printer is backed by a full-year warranty.
Check the chart (opposite). And if you still have questions, we still have people with answers. Call toll-free.

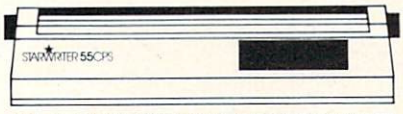
WHICH PRINTER TO PICK:

(A survivor's friend.)



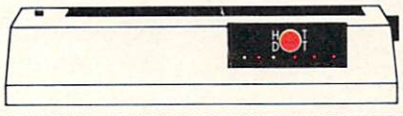
18 CPS LETTER-QUALITY PRINTER

40 CPS LETTER-QUALITY PRINTER



55 CPS LETTER-QUALITY PRINTER

180 CPS DOT-MATRIX PRINTER

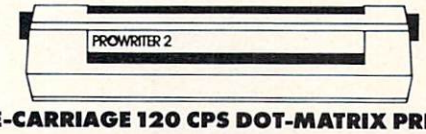


WIDE-CARRIAGE 180 CPS DOT-MATRIX PRINTER

180 CPS COLOR DOT-MATRIX PRINTER

WIDE-CARRIAGE 180 CPS COLOR DOT-MATRIX PRINTER

120 CPS DOT-MATRIX PRINTER



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FAMILY COMPUTING™

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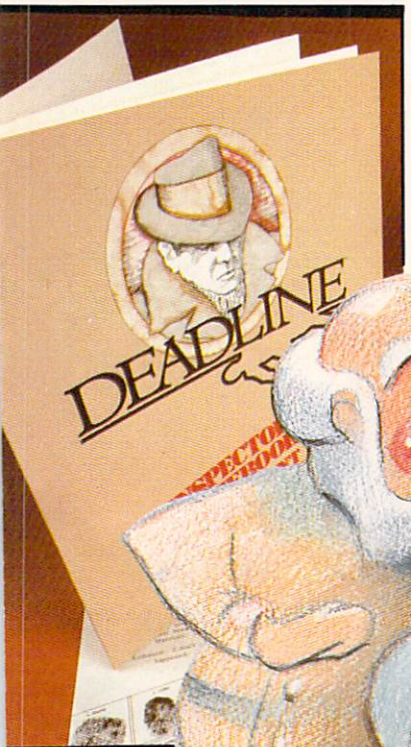

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JUNE
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PUBLISHED BY SCHOLASTIC INC.

VOLUME 2
NUMBER 6

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For enthusiasts of all levels.

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FAMILY COMPUTING (ISSN 0738-6079) is published monthly by Scholastic Inc., 730 Broadway, New York, NY 10003. Subscriptions: in the U.S. and possessions, 12 issues for $17.97; outside the U.S. add $6 (surface mail) or $24 (airmail). Office of publication: 351 Garver Rd., P.O. Box 2700, Monroe, OH 45050-2700. Application to Mail at Second Class Postage Rates is pending at Monroe, Ohio, 45050-9998 and additional offices. POSTMASTER: Send address changes and notice of undelivered copies to FAMILY COMPUTING, P.O. Box 2511, Boulder, CO 80322. Printed in U.S.A. Copyright © 1984 by Scholastic Inc. All rights reserved.

COVER PHOTOGRAPHS BY LANGDON CLAY
INSET PHOTOGRAPH BY ROGER RESSMEYER

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Page 106

Introducing software for people who want to tell their computer what to do but don't know what to say.

Of course you know what you want your computer to do. Trouble is, up 'til now, you either had to settle for packaged software off the shelf, which meant squeezing your ideas into somebody else's design. Or you struggled to learn a computer language. And you know how far you got with that.

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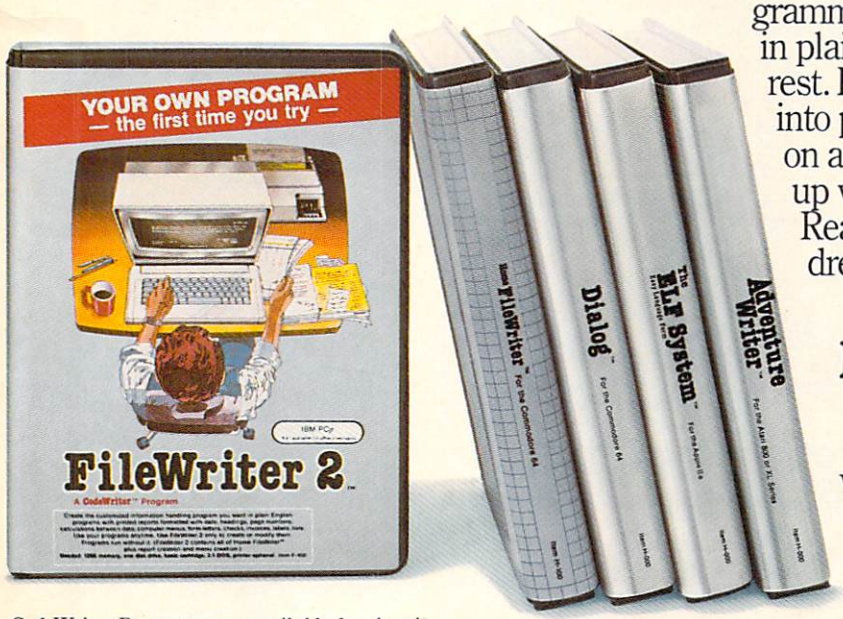
CodeWriter software lets you create custom software to handle your information, your way. The first time. And you don't have to know a thing about programming. You type in your information in plain English. CodeWriter does the rest. It translates what you've written into program code, then saves it on a separate disk. What you wind up with are your own programs. Ready to run. As many as you can dream up. At a fraction of the cost.



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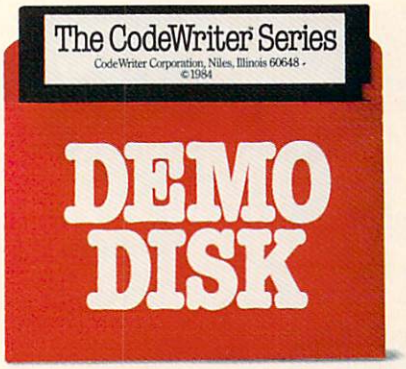

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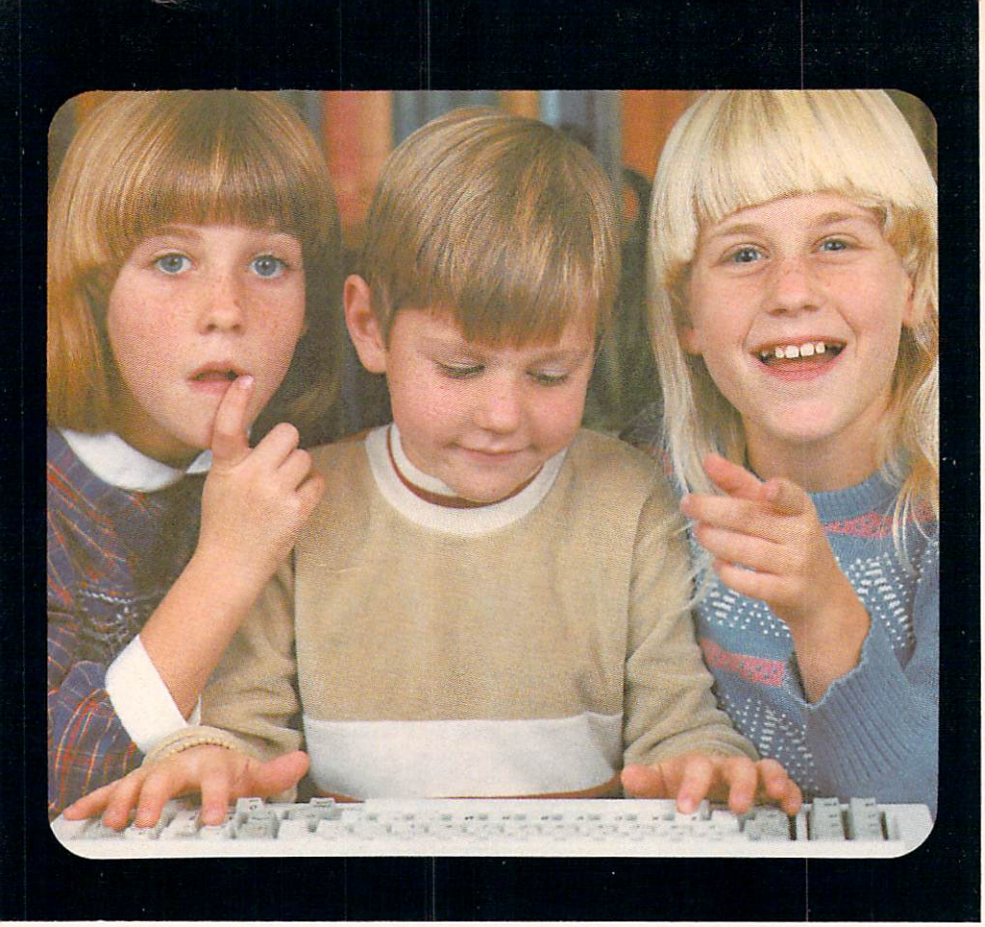

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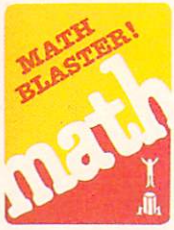

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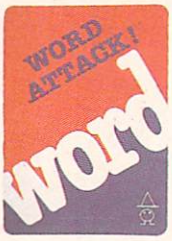

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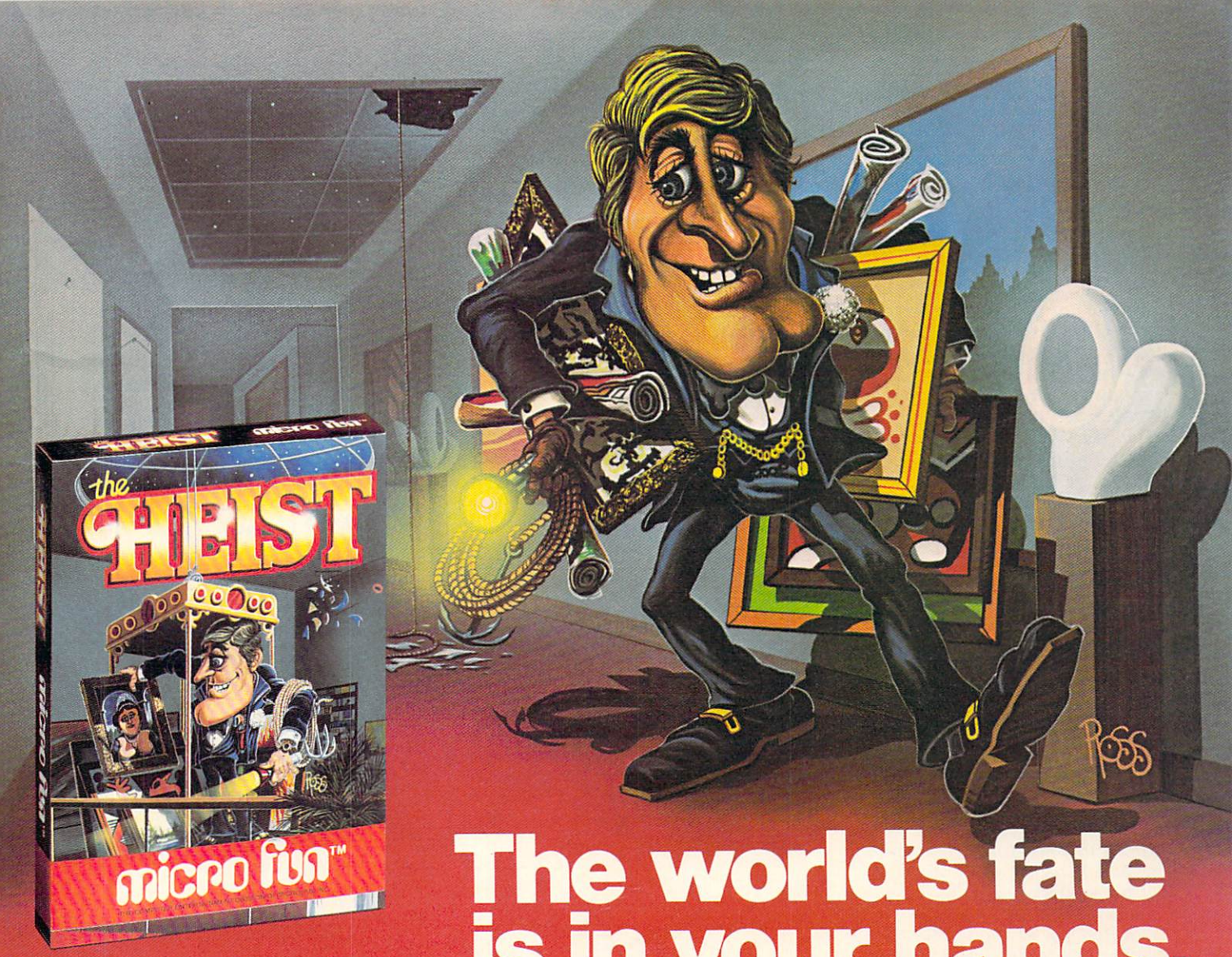
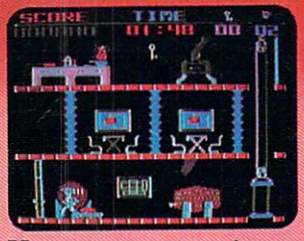


The world's fate is in your hands.



Picture yourself as the world's greatest super-agent, Graham Crackers. You must go undercover and sneak into an enormous art museum. Incredibly, it's a front for an international terrorist organization!

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EDITOR'S NOTE
WHEN BIG NEWS HITS

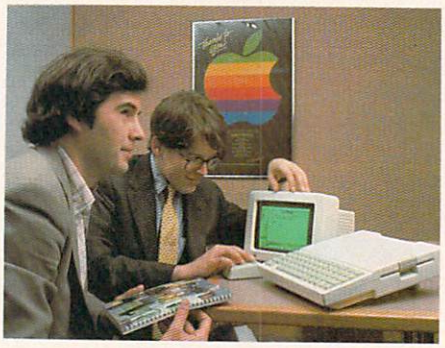
Every time a new computer is announced, just about everyone seems interested. All the people waiting to buy their first one are watching to see if this is "it." For computer owners there are two questions: "Is this computer better than the one I already have?" and "Should this be my next acquisition?"

The rumor mill in the computer industry is an active one. When a major company is expected to issue a new release, the stories speculating on its features spread like wildfire, peaking just before the announcement finally comes. It's actually quite exciting.

Getting the news is just the beginning. Knowing how to use it in the best interest of readers is the real job of a magazine. In this issue of FAMILY COMPUTING we bring you some up-to-the minute coverage of a new computer—a preview of the Apple IIc. A preview is our standard way of introducing a new computer, and is based on limited use with the model, usually at a press meeting or special viewing.

In the case of the IIc, Features Editor Nick Sullivan and Technical Editor John Jainschigg flew out to Apple headquarters in California, where they were joined by photographer Roger Ressmeyer for a day with Apple designers and members of the IIc team. Their story (on page 67) is intended to introduce the machine, to present its important new features, and to place it in the context of reader needs and its market. And they had to do this without getting their heads turned by all the special attention they received. A tough assignment. But I think they did a great job meeting their No. 1 responsibility—to file an objective report for you, our readers.

Following a preview, we wait until an actual production model is



FAMILY COMPUTING Editors Nick Sullivan (left) and John Jainschigg try out the IIc at Apple headquarters.

ready to be put to the rigorous test of family use, in a situation that might be much like your own. Then we publish an actual review of the model based on this more extended trial. (Our review of the IIc will appear in a future issue.)

Another major kind of information we provide readers on computers can be found in our revised Buyer's guide to popular brands for family use (page 61). Here we examine the established models, and if you're in the market for a computer, you'll find this to be an important source of guidance as you try to arrive at your decision.

Of course, not all this issue is devoted to machines. We haven't forsaken our basic commitment to people and the ways they use computers. Be sure to check the Table of Contents for our roundup of new, low-cost, easy-to-use word-processing programs; the story of a mom-and-pop computer store; the news of 5-year-olds who write using computers; all-new programs for you to try; software reviews; and more features and departments designed to help you become more expert with your computer.

Claudia Cohl

CLAUDIA COHL
EDITOR-IN-CHIEF

Upcoming Features in FAMILY COMPUTING

How to Work the Computer Into Your Family

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LETTERS

MANY THANKS

Thank you. Thank you. Thank you. As you no doubt can tell, I am quite pleased with your publication. It is really nice to be able to find a magazine for families that have home computers.

Thank you. Thank you. Thank you.

This second round of thanks is for recognizing that all families cannot afford $1,500-and-up computer systems, by including programs for Timex Sinclair computers.

Please keep Timex users in mind as you have in your past issues. In fact, my very reason for subscribing to FAMILY COMPUTING was because you did include us.

STEVEN COTTRELL
Allen Park, MI

HELP FOR THE ENTREPRENEUR

In the February (*1984*) issue, you featured an article by P. Gregory Springer, entitled "Home Business: Typesetting By Modem."

I wish to start a small home business in Sioux Falls such as the one described in the article, but I have no idea how to go about it. I would appreciate any help you can give me.

DAN CANETE
Sioux Falls, SD

EDITOR'S NOTE: *First, of course, you need a modem and some communications software. Practice typesetting by phone before you try to start a business. Intergraphics, 106-A S. Columbus St., Alexandria, VA 22314; (800) 368-3342, is a good place to start. They'll send you an instruction book for $10, allow you to send files over toll-free lines, and then send the typeset material back to you.*

A TRIUMPHANT TREK

I am just writing to tell you that I thought your *Ski Trek* game in the February (*1984*) issue was great! I am involved in a computer course at my school, and I put the game on the TRS-80s. Everyone loved it! Please continue putting these great games in your magazine.

ANDY HUDSON
Fort Knox, KY

SOME GUIDELINES FROM A GARDENER

I enjoyed the March 1984 cover story about gardening with a computer. But, before buying an expensive program just to keep garden records, readers should look through Charles D. Sternberg's *Basic Computer Programs for the Home* (Hayden Book Company, Rochelle Park [now Hasbrouck Heights], NJ; 1980). The book lists several scheduling and calendar programs; two are specifically for gardeners: "Lawn/Plant Care" and "Greenhouse." Selling for only $10.95, Sternberg's book is much cheaper than the programs listed in the article.

FRANCES F. JOHNSON
Clinton, NC

FORGOTTEN MACHINES?

In looking through your magazines, I have found that none of them are geared to a Morrow computer, which I have.

I have had the Morrow computer (a CP/M-based machine) just a few months, and possibly it is my fault that I haven't been able to apply any information from the magazine to my computer.

Please advise me if the information you supply is of any use to me.

CAROLE J. VOGELER
Glendale, WI

I have just received my third issue of FAMILY COMPUTING, and in general, I have enjoyed the contents of the magazine. However, as a novice with a CP/M-based machine (Sanyo MBC 1000), I find virtually no references in your magazine to software or peripherals applicable. I wonder if this is an intentional exclusion, and if so, why?

H.C. MOSHER
Casper, WY

EDITOR'S NOTE: *Although we would like to cover all machines, we sometimes must set limits. Less than 1 percent of our readers have CP/M machines. Nonetheless, in response to the amount of mail we have received, we are planning an article on converting Applesoft code to CP/M.*

CORRECTIONS

In a chart accompanying "Different Versions of Logo" (February 1984, page 68), we said users could acquire backup copies of Commodore Logo by sending $5 to Commodore. This statement was incorrect. This policy refers only to defective or user-damaged disks, which must be returned with the fee to get a replacement. At this time, the company does not provide backup disks for Commodore Logo.

In the March Software Guide, the hardware requirements and backup policies for The Game Show *from Advanced Ideas (formerly Computer Advanced Ideas) and* Gertrude's Puzzles *from the Learning Company and the backup policy for Advanced Ideas'* Master Match *were reported incorrectly. In addition to replacing defective or user-damaged disks free of charge within one year of purchase, Advanced Ideas provides free backup disks. The Learning Company replaces defective disks for free within 90 days of purchase, and for a $12 fee thereafter.* The Game Show *is available in disk for the Commodore 64, and IBM PC computers, as well as the Apple.* Gertrude's Puzzles *is available only for the Apple II/II plus and IIe.*

Ships Ahoy, *by Unicorn Software, reviewed in the Software Guide (April 1984, page 120), covers addition, subtraction, multiplication, and division at three skill levels for children ages 5–10. The program for younger children,* Ten Little Robots, *reviewed on the same page, contains a reading readiness activity and presents a number of basic arithmetic skills. It does not contain a number-recognition activity, as was stated.*

FAMILY COMPUTING *looks forward to letters from all our readers. Please direct your correspondence to: Letters to the Editor,* FAMILY COMPUTING, *730 Broadway, New York, NY 10003. Include your name, address, and phone number. We reserve the right to edit your letters for length and clarity.*

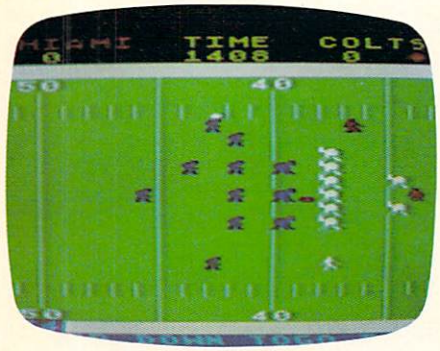
Sports Illustrated
Sports Special
microcomputer news
Tuesday, April 1

Four exciting sports games from Avalon Hill

Colts romp over Dolphins, 24-7

Last night's sensational gridiron duel proved there are no underdogs in Avalon Hill's **Computer Football Strategy**.

The Colts ran in the first Miami punt and then capitalized on a Dolphin fumble to jump out to a quick 14-0 lead.



Early in the 1st qtr. with Colts in possession
ATARI SCREEN

Dropped passes, penalties, fumbles . . . all took their toll in the exciting contest in the home of Ogie Pincikowski, newest armchair quarterback. Says Ogie with some satisfaction, "It's the next best thing to being out on the gridiron itself!"

In Avalon Hill's **Computer Football Strategy** you pit your skills as play caller against the computer or go head-to-head with a live opponent.

Atari® Home Computers 32K Disk (joystick required); Commodore 64® Disk; IBM® PC 64K Disk; TRS-80® 32K Disk and 32K Cassette for Models I/III/IV; Commodore 64® Cassette & Atari® Home Computers Cassette. All Diskettes $21; Cassettes $16.

Marciano to spar Ali

Tomorrow night's 15 round **Computer Title Bout** matchup between two of professional boxing's greatest fighters promises to be historic in all senses of the word.

This "Match from the Past", as the bout has been dubbed, is slated to begin at 9pm in the basement of Marvin "Max" Maxwell's house on the outskirts of Baltimore. States Max, "I've always wondered if the incredible boxing skills of Ali could stand up to the sledgehammer fists of the Brockton Blockbuster."

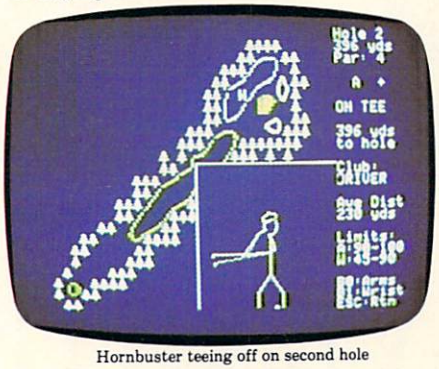
Avalon Hill's **Computer Titlebout** will factor in dozens of variables in deciding the ultimate winner, round by grueling round.

Adds Max, "The game gives you the statistics of hundreds of contenders, and lets you do the pairing up. In fact, you can even create your own fighter. **Computer Title Bout** is a fast-moving game for two players, or solitaire against yourself."

Atari Home Computers 48K Disk for $30.

Tournament Golf a hole-in-one

"Sixteen feet to the hole and a steep break to the left." Harvey Hornbuster carefully considered his predicament. The entire match had come down to this last putt. Sink it and he's a hero; miss it and he'll be buying the drinks.



Hornbuster teeing off on second hole

Carefully, with a steady hand and just the right twist to the wrists, Harvey took his putt. Looking over his shoulders at the video screen, the other members of his foursome held their breath and stared as the ball steadily approached the hole and then disappeared. A perfect putt!!

Tournament Golf brings you all the tense excitement of a real day out on the links right in your own home. Hooks, slices, muffs, traps, water hazards and rough . . . it's all there and more, including **two** challenging 18 hole championship golf courses.

Apple Home computers 48K Disk for $30. Joystick/Paddles required.

Upstart Cubs Take AH Series in 6

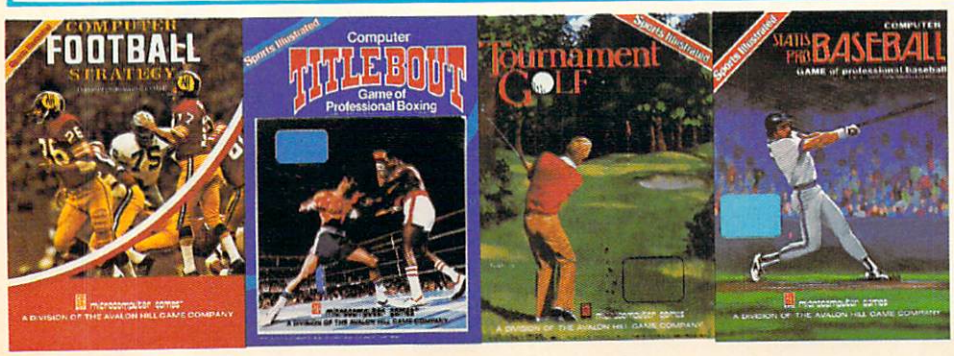
Chicago's stunning victory yesterday in the living room of **Computer Statis Pro Baseball's** AH-League manager Milton Mousehouse didn't surprise the team's owner, Fred Smith. Commented Smith after the victory, "It was just sound management. My lineup selection, pitcher choices and timely substitutions carried me through."

Trailing 4 to 1 going into the ninth inning, the Cubs' bats finally came alive as they pounded in 5 runs to win the game, and the championship, 6 to 4. A good showing for Fred's cubs, especially after dropping the first two games to the defending champions, the Baltimore Orioles.

Added Milton, "Avalon Hill's **Computer Statis Pro Baseball** places you in charge of your favorite ballclub. **Your** decisions can make an also-ran into a pennant winner. You don't play against the computer. You can, however, play against yourself and have the computer do all the bookkeeping. It will even supply you with a printout of the boxscores after each game, if you have a printer."

Of course, you can also do as Milton and his friends did and organize a league of your own, capping it off with your own championship series. **Computer Statis Pro Baseball** puts you in the dugout, so to speak, especially with Milton's wife Mortina supplying the hot dogs!

Apple Home Computers 48K Disk for $35; TRS-80 Mods. I/III/IV: 16K Cassette $25 & 32K Disk $35.



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ELEVEN THINGS YOU CAN DO ON THE VERY FIRST DAY.

Your first day with PC*jr* isn't just exciting.

It's rewarding.

This IBM® personal computer quickly hooks up to the family TV. And there's a lot you can do right from the start.

PC*jr* MAKES IT EASY

PC*jr* was designed to make the whole family feel at home with computers.

The keyboard, for example, doesn't need a connecting cord. This refreshing bit of technology—the IBM "Freeboard"—frees you to get comfortable up to twenty feet away.

And the keys are color-coded, so even a beginner can find the right key for the right job.

Right away.

1. **Home Loan**
2. **Monthly Expenses**
3. **Word Race**
4. **Shopping List**
5. **Recipe File**
6. **Tile Game**
7. **Typewriter**
8. **Alarm Clock**
9. **Checkbook**
10. **Address Book**
11. **Telephone Connector**

YOU'RE OFF AND RUNNING

You can start using PC*jr* as soon as you set it up. The Sampler Diskette (included with diskette-drive models) gives you eleven useful mini-programs to choose from.

Including:

A home spreadsheet to help keep your expenses in line.

An electronic address book to help you sort out who's who and who's where.

A home loan calculator that can tell you interesting things about your principal.

An easy-access file for recipes. A checkbook balancer. And a challenging word game.

Of course, the Sampler Diskette is merely a taste of what you can do with PC*jr*. You can buy easy-to-follow programs to help you write letters, plan your finances, educate the kids, file tax data—to help the whole family use its time to better advantage.

Plus, PC*jr* runs many of the IBM Personal Computer programs that run on the IBM PC and PC/XT. So you can finish at home what you start at the office, and vice versa.

And when it's time to relax, PC*jr* is always game. Plug in an entertainment cartridge and let the fun begin.

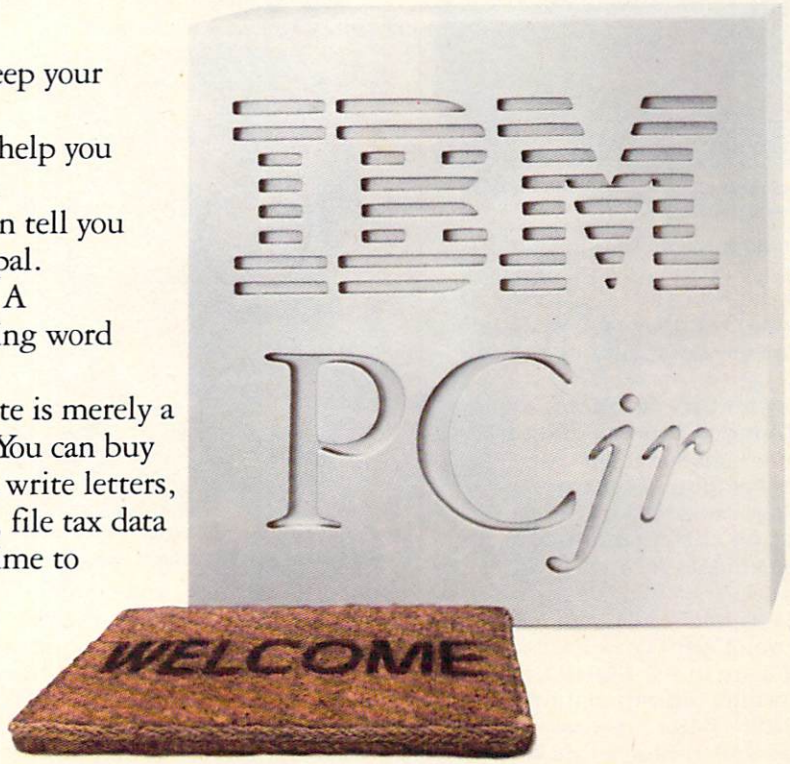
A COMPUTER THAT CAN GROW WITH YOU

PC*jr* is the most affordable of the IBM personal computers.

You can start with the 128KB model, equipped with a diskette drive, for about $1300. Or the 64KB base model, for about $700. (Prices apply at IBM Product Centers, and may vary at other stores.)

And as your needs become more sophisticated, PC*jr* can easily keep pace. With add-it-yourself options like a printer, diskette drive and internal modem for telecommunications, even the lowest-priced model can grow up fast.

Visit an authorized IBM PC*jr* dealer or IBM Product Center and see all the things PC*jr* can do. For the location nearest you, call 1-800-IBM-PCJR. In Alaska and Hawaii, 1-800-447-0890.



Little Tramp character licensed by Bubbles Inc., s.a.

BEHIND THE SCREENS

PEOPLE, NEWS, AND TRENDS

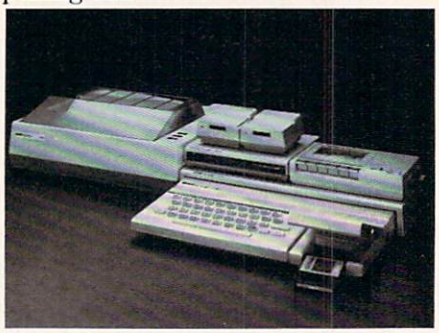
EDITED BY BILL CAMARDA

Timex Sinclair Support

In the wake of Timex's recent withdrawal from the home computer market, software for Timex machines will become harder to find, but service won't be a problem.

Timex will honor warranties. Repairs of Timex computers, whether under warranty or not, will continue to be handled through the company's service center in Little Rock, Arkansas.

Timex will maintain an inventory of software for at least a year, but consumers will have to order it from the company by phone. The toll-free number is (800) 24-TIMEX. Timeworks, one major third-party manufacturer of Timex software, is selling out the last of its inventory and producing no new Timex products. Other suppliers of Timex software are now evaluating the situation; some have already joined Timeworks in pulling out.



Timex is also dropping the modem, disk drive and printer it promised.

One company that still intends to sell some Timex hardware and software is the E. Arthur Brown Co. in Minnesota. For a catalog, write to: 3404 Pawnee Lane, Alexandria, MN 56308.

FAMILY COMPUTING will continue to cover Timex computers, and we'll print programs for them.

Timex computers are based on technology developed by Sinclair, Britain's No. 1 computer maker. Before licensing its technology to Timex, Sinclair sold its computers in America by mail order. But Sinclair says it won't sell Timex hardware and software in the United States.

Meanwhile, Sinclair will introduce a new 128K, $499 business computer in the United States this winter. It will come with data base, spreadsheet, word-processing, and graphics software. If the new computer—dubbed QL (for quantum leap)—really delivers all it promises for $499, its name will be appropriate. But it won't be compatible with any other Timex or Sinclair computer.

PHOTOGRAPH: TIMEX

The Ada Boom

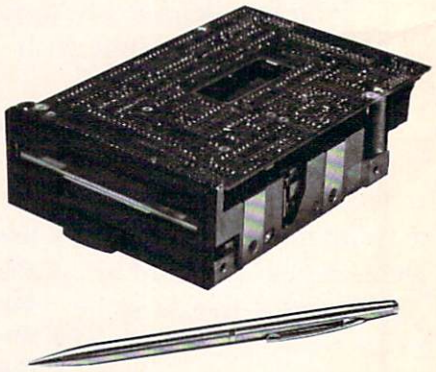
If you're a programmer, or plan to become one soon, here's some free advice worth thousands of dollars: Learn Ada, the computer language developed by the U.S. Department of Defense to finally standardize American military computers. According to market researchers IRD, Inc. of Norwalk, Connecticut, there are far too few competent Ada programmers to meet the coming demand. IRD Ada expert Steven Weissman says the six months of training a skilled programmer needs to master Ada could be worth "an instant annual raise of roughly $4,500 for an entry-level programmer, and maybe $8,000 for a project manager."

Portions of Ada are available on some sophisticated microcomputers, but it's no beginner's language. The language, which descended from Pascal, is named after Lady Ada Lovelace, daughter of the poet Lord Byron. Lovelace's ideas were the foundation for modern computer programming. She worked with Charles Babbage, who designed the "Analytical Engine," a 19th-century precursor to the computer. She explained the engine poetically, saying it "weaves algebraic patterns just as the loom weaves flowers and leaves."

Lady Ada Lovelace, namesake of the Defense Department's new computer language.

PHOTOGRAPH: CULVER PICTURES

The Incredible Shrinking Floppy



The Shugart 350 double-sided, double-density microfloppy will store 819K on a single disk, after formatting.

PHOTOGRAPH: SHUGART CORPORATION

A few years ago, the original 8-inch floppy disk gave way to the 5¼-inch minifloppy. Now, there's a new, even smaller entry: the *micro*floppy.

Apple's Macintosh and the Hewlett-Packard HP-150 use a 3½-inch microfloppy encased in a hard shell, which was developed by Sony. Apple's choice has given the 3½-inch microfloppy a major boost, but Sony's disk has competition. Hitachi and Maxell make a 3-inch hard-shelled microfloppy, which has been sold primarily in Europe and Japan.

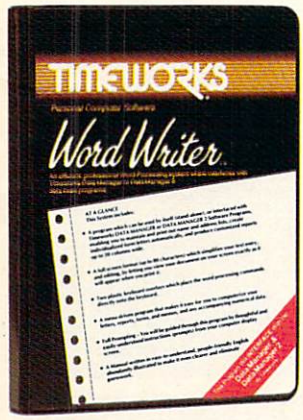
California disk-maker Dysan is actively promoting a 3¼-inch version without a hard shell. It resembles a standard 5¼-inch disk. Seequa's Portable 325 Chameleon computer uses the Dysan disk, and Dysan says it is lining up some larger manufacturers.

Microfloppy drives are expected to be used widely in future compact and portable computers, because they give off less heat, weigh less, and need less power. They can easily run on batteries. Plus, the disks fit in most shirt pockets.

Apple microfloppies cost 20 percent more than Apple minifloppies, but they store nearly three times as much information. On other computers, however, the storage disparity is much narrower.

As with much new computer technology, microfloppies aren't yet backed with much software. But many companies say they're developing Macintosh software, and Dysan is licensing major software products for its 3¼-inch disk. →

IF YOU CAN FIND A BETTER WORD PROCESSOR OR DATA BASE SYSTEM WE'LL BUY IT FOR YOU.



Outrageous offer? Not really. For your Commodore 64, we're putting our money where our mouth is, because the Timeworks Word Writer and Timeworks Data Manager 2 are so complete—so extremely easy to use, we think nothing beats them at any price. (Our suggested retail prices are: $49.95 for Word Writer. $49.95 for Data Manager 2.)

Word Writer

This menu-driven system includes:

A program which can be used by itself (standalone), or interfaced with Timeworks' Data Manager or Data Manager 2, enabling you to maintain and print out name and address lists, create individualized form letters automatically, and produce customized reports up to 20 columns wide, which can be incorporated into any text produced by the Word Writer.

Two plastic keyboard overlays which place the word processing commands directly onto the keyboard.

A full screen format (up to 80 characters) which simplifies your text entry and editing.

All the essential features—plus some exclusive Timeworks extras—making this system completely functional for most home & business requirements.

Data Manager 2

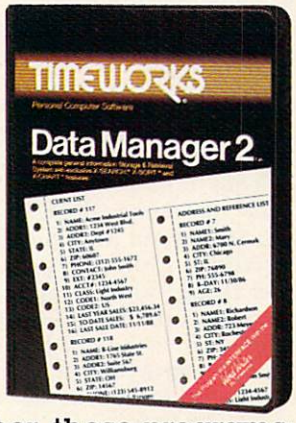
This system includes:

A menu-driven program that easily lets you store information on a wide variety of subjects—from general name and address lists, to research data. This program will also calculate and store any corresponding numerical data.

Quick access to important information. Items can be easily retrieved and printed by category, name, index code, date range, amount range, or any category of information stored in the system.

Available for: Commodore 64 – IBM, PC/PC Jr. and Compatible Computers.

Timeworks exclusive X-Search,™ X-Sort™ and X-Chart™ features allow you to easily cross-search any of the categories. Or arrange your stored items in increasing or decreasing order, alphabetically, numerically or by date. Break down statistical information by up to ten indexed categories of your choice—and graphically review your results.



Arithmetic calculation of your mathematical data is possible, allowing you to perform Payroll calculation, cost estimates and more. Data Manager 2 also produces the Sum, Average and Standard Deviation of statistical data entered into the system, along with Frequency Charts.

When interfaced together, these programs:

Generate customized data reports, which can be incorporated into any written text produced.

Individually address and print form letters automatically.

Print your name and address file onto standard mailing labels.

Transfer and print text information onto labels and tags.

Calculated numerical data from column to column, giving these programs spread-sheet capabilities.

So, if you can find anything better, simply send us your Word Writer or your Data Manager 2, your paid receipt, and the name of the word writer or data base system you want. If it's available, we'll buy it for you.**

Now at your favorite dealer. Or contact Timeworks, Inc., P.O. Box 321, Deerfield, IL 60015. Phone 312-291-9200.

TIMEWORKS

SOFTWARE WITH SUBSTANCE.

**Now for the small print. Offer applies to Commodore only, with maximum suggested retail prices of $125.00 each for any exchanged program. Offer expires 45 days after date of your purchase.

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BEHIND THE SCREENS

About that 5¼-inch disk drive you just spent hundreds of dollars on: It's far from obsolete. According to Dataquest, a California research firm, minifloppies outsold microfloppies 50-to-1 last year, and the microfloppies won't catch up until at least 1989.

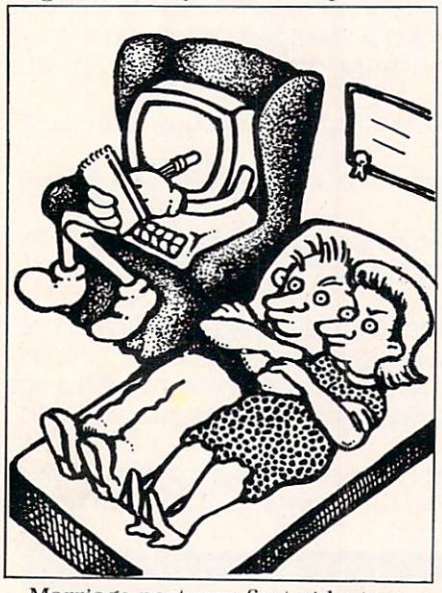
—ROBIN RASKIN and BILL CAMARDA

The Silicon Counselor

So, there are things you'd never discuss with another living soul? Would you tell them to a computer?

You might. Back in the 1960s, scientists were amazed at the revealing things people told *Eliza*, the first program designed to simulate a psychiatrist.

Now, following *Eliza*, comes *MAGIE*: Minnesota Automated Guided Interaction Enhancement. Among other things, that means electronic marriage counseling. Dr. James Ayers, a University of Minnesota psychologist, says *MAGIE* "allows for interpersonal feedback, and that is a rare commodity, especially in marriage and family relationships."



Marriage partners first videotape a conversation about something in their relationship that's bothering them. Then, they watch themselves on tape. As they do so, each responds to statements like: "Right here I feel relaxed," displayed on the Apple IIe screen in front of them. The results, in disk and printout form, can later be compared and used to help people learn about each other—and themselves.

Ayers says *MAGIE* will work not only in counseling couples, but also in relationships between employer and employee. He says a human counselor should be available at some point in the process to help people interpret their results.

The complete *MAGIE* system for the Apple IIe, including the computer, software, and video equipment, may be ready for sale this month, Ayers says. It will cost $12,000. An IBM version will follow. Ayers says that nonprofit institutions should be able to offer it to couples for several weekly sessions, at "about the price of an adult-education course."

Valley Girl Meets Computer Salesman

Computers are the heroes of an educational musical extravaganza for children, called *Bits & Bytes*. Created by South Coast Repertory Theatre of Costa Mesa, California, the play is now introducing computers and their repercussions to school audiences across the country.

The heroine of *Bits & Bytes* is Happy, a Valley girl in search of happiness. Happy happens upon fast-talking computer salesman Morton B. Norton at the local Computer-Rama. He sets out to educate Happy, and—not incidentally—to sell her a computer it'll take her 53 years to pay for.

Norton's helpers include an endearing group of singing insects, called the Bugs Brothers; Mr. Chips, the singing slab of silicon; and two crooning assistants, Bits and Bytes.

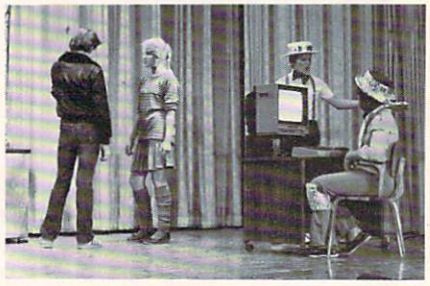
At the play's climax, Happy's about to sign on the dotted line, when there's a puff of smoke, and . . .

HAPPY: It's dead! The computer is dead!
NORTON: It's not dead. Dead is such a harsh word. Must be something to do with the power . . . .
HAPPY: Well, I'm not happy now, I can tell you that!
NORTON: Just sign the contract while we change a fuse.
HAPPY: You think I just fell off the turnip truck? It doesn't work! I'm not paying you 53 years for something that doesn't work!
NORTON: It works. It's the fastest, most efficient machine in the world. It's gone to the moon. It regulates our air temperature. It cooks our food. It wakes us up. It . . . .
HAPPY: DOESN'T WORK!*

There's a happy ending, which teaches children that computers, while remarkable, can't replace human feelings, and that you shouldn't believe everything salesmen tell you.

Schools and organizations wanting to stage the play can purchase the script and score of *Bits & Bytes* from Pioneer Drama Service, P.O. Box 22555, Denver, CO 80222. One group of students, from Peabody Junior High School in Peabody, Kansas, developed a new variation on the play's computer theme. Dale Belcher, the school's music teacher and director, "didn't play a single note." He left the score to his trusty Commodore 64 backstage. The students loved acting and singing with their computerized accompaniment. It never missed a beat, and neither did they.

—ROBIN RASKIN



At Peabody Junior High School in Peabody, Kansas, the students did the acting—and a Commodore 64 provided the music.

Nibbles

Free Computer Camp Guide: If you're still looking for a computer camp, disk manufacturer Verbatim and the American Camping Association have collaborated on a free guide to more than 100 computer camps. You can get one by sending $1 (the ubiquitous postage and handling) payable to Verbatim, to: *Camps 'n' Computers*, Suite 228, 4966 El Camino Real, Los Altos, CA 94022 . . . .

Update: Last month we told you about "Chips & Changes," the museum exhibition that will be traveling across America for the next two years, teaching—and raising questions—about computers and their repercussions. We're pleased to add that FAMILY COMPUTING will be a sponsor of "Chips & Changes." K-POWER, Scholastic's newest computer magazine for young people, and FAMILY COMPUTING will be the only magazines distributed at the exhibition. Look for us there!

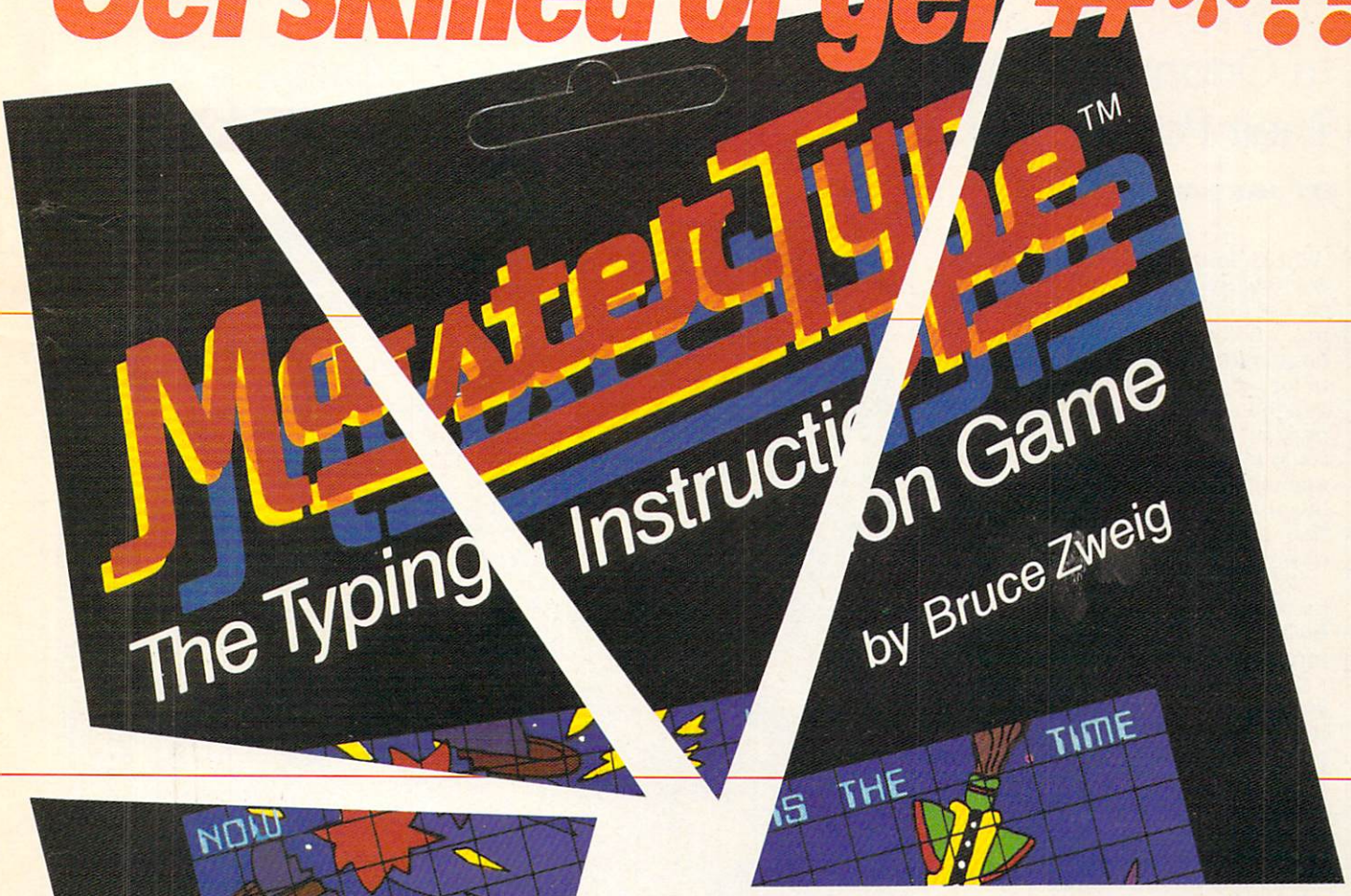
If you've got a good bite-sized piece of computer-related news involving people, trends, or innovations, let's hear it. We will pay $25 for each item we publish. Write to Behind the Screens, c/o FAMILY COMPUTING, *730 Broadway, New York, NY 10003.*

*"BITS AND BYTES," © 1983, BY PIONEER DRAMA SERVICE, DENVER, COLORADO

ILLUSTRATION BY HOLLY KOWITT

PHOTOGRAPH BY DEL LINDSEY

Get skilled or get #*?!



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Atari®
Commodore 64®
IBM-PC®
Cartridge:
Atari®
Commodore 64®

The Scarborough System.

You'll grow with us.

© Scarborough Systems, Inc.

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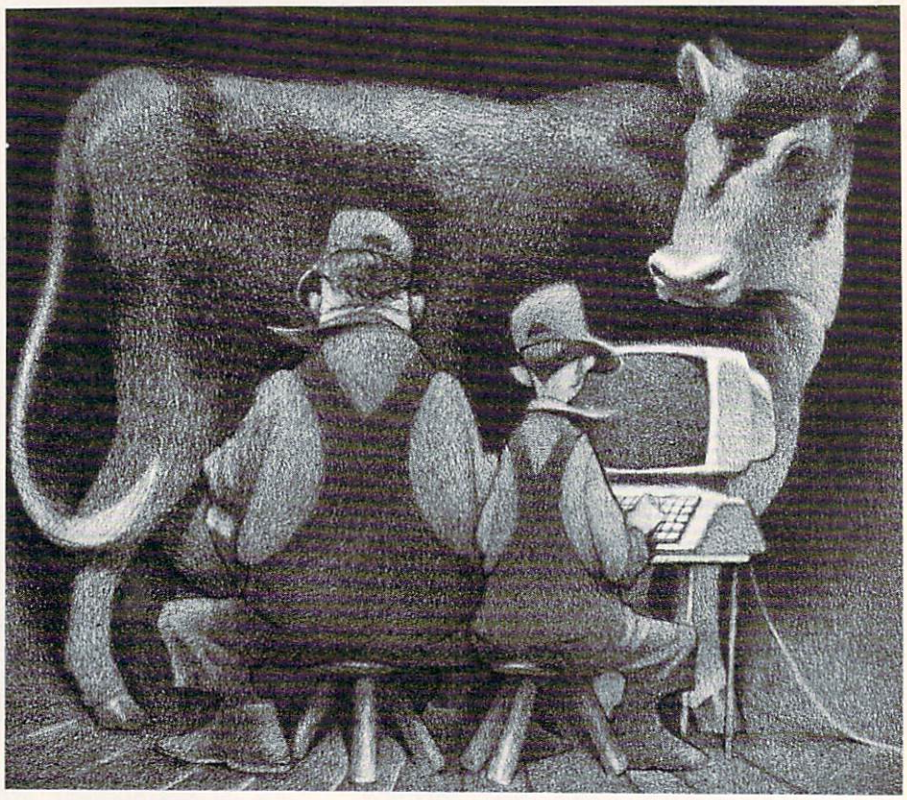
HOME-SCHOOL CONNECTION

TOMORROW'S VISIFARMERS
In Ortonville, Minnesota, Teenagers are Helping Their Parents Run the Family Farm—Using *VisiCalc*

BY JOE NATHAN



"When I first heard about computers, I figured they were for businesses, not for farming," says Don Nolting, who has been raising sheep, hogs and cattle in Western Minnesota for more than 30 years. "Then my daughter Angie brought home a printout she'd run at school. You could tell whether our farm was making or losing money by just looking at one sheet of paper, rather than going through a whole box of records."

Nolting smiles as he sits in a booth in the Hole in the Wall Cafe, in Ortonville, Minnesota. "I'm really proud of what Angie is doing."

Sixteen-year-old Angie Nolting is just one of many students who are immersed in Ortonville's school computer program, which extends from kindergarten through 12th grade. The town's schools are replete with Commodores, Ataris, and Apples. Students use them for word processing, programming and simulations, drill and practice, computer-assisted instruction, and more. But what really sets Ortonville apart, and what parents like most, is how the schools teach their children computer skills that can be used at home, on the farm.

SEEKING NEW WAYS TO HELP

Ortonville is a town of 2,551 people, located 175 miles west of Minneapolis/St. Paul, near the South Dakota border. The school's 819 students, roughly half of them farm youngsters, come from the town, the surrounding farm country, and from neighboring Big Stone City, South Dakota.

The Ortonville schools began using computers in 1977, after Superintendent Burton Nypen and math teacher Jay Ross won a grant from the Minnesota Department of Education's Council on Quality Education. Soon afterwards, the school offered to help a local farm-tool company computerize its inventory. Students modified an existing inventory program, and generated reports.

"It was great for our students," Nypen says, "and it opened up a new world for the company. Within a year or two, the company bought its own computer."

School administrators started looking for other ways they could use their computers to serve the community. Ortonville's vocational agriculture education instructor, Phillip Iverson, started exploring computer applications in farming. "It's obvious that farms are operating on smaller and smaller margins," he says, explaining that farmers all over the country are facing a classic squeeze. The price of raw materials is constantly increasing while the price they get for their crops has stayed the same or gone down.

"Only the most efficient farms are going to survive," Iverson concludes.

Yet, in more than 25 years of teaching, he found that agricultural bookkeeping was often neglected. "You can only teach so much record keeping, and then you lose a person's attention. [Bookkeeping] is so time-consuming that it's often left until too late."

He saw that computers could make the task of keeping the books both more efficient and more rewarding. Iverson found that computers encouraged students to complete their records since it gave them an incentive: the ability to do very powerful analysis. "We do other things in agricultural education besides use the computer," Iverson said. "But it's a great motivator."

INTRODUCING SPREADSHEETS

In the elective agriculture education classes he teaches, Iverson uses the spreadsheet *VisiCalc* and agricultural "template" programs, especially *F.A.R.M. AIDS (Farm Accounts and Records Management)*. *F.A.R.M. AIDS* adapts *VisiCalc* to many of the specific kinds of calculations farmers need to make. →

ILLUSTRATION BY CARTER GOODRICH

JOE NATHAN *of St. Paul, Minnesota, a former teacher and administrator, is the author of* Free to Teach: Achieving Equity and Excellence in Schools.

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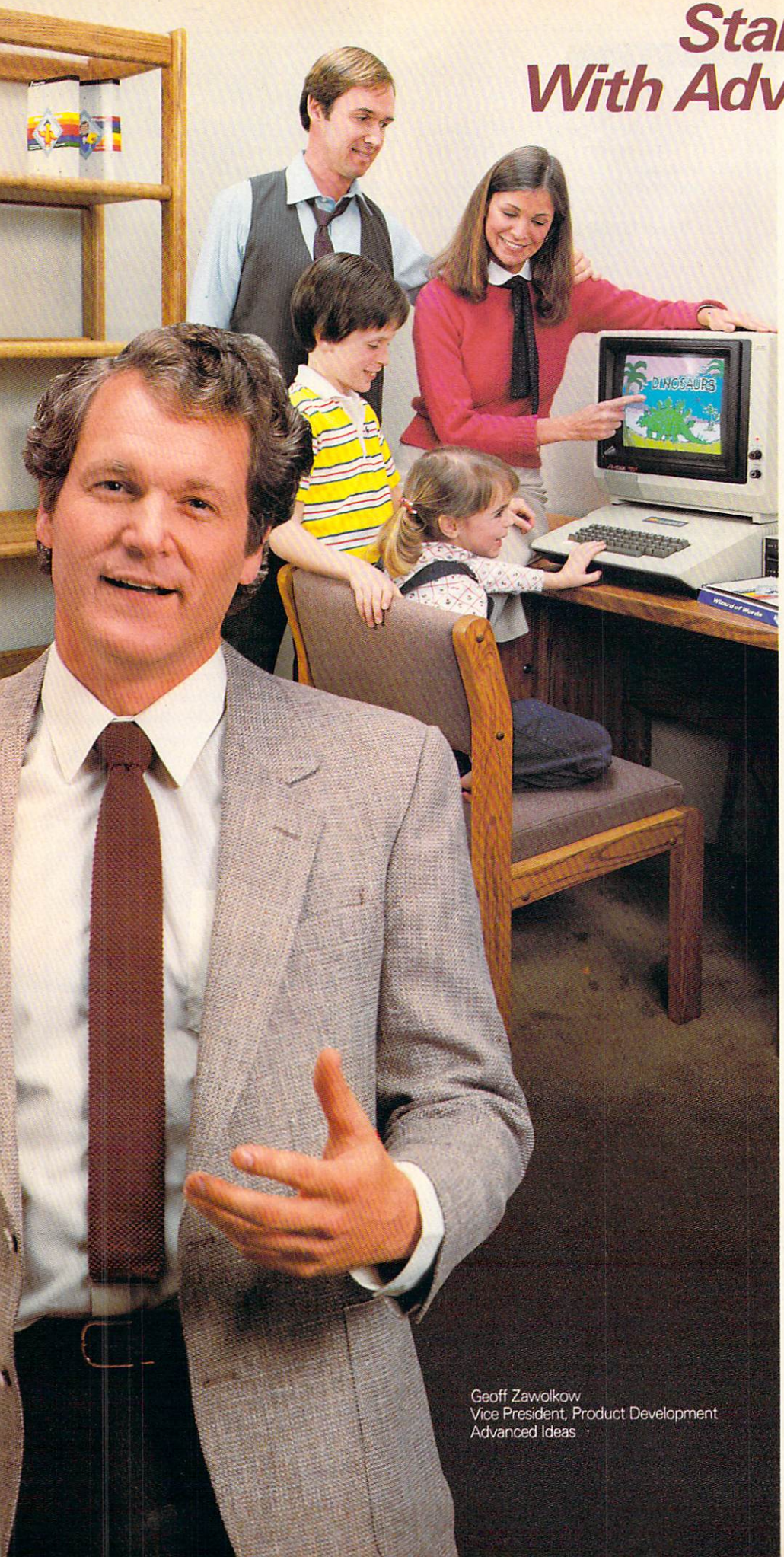

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Iverson's high-school students start by analyzing the finances of a fictitious farm, and eventually move on to studying their own family's farm. Students who don't live on farms team up with those who do.

Leah Moen, a high-school senior and president of the local Future Farmers of America, is a strong computer advocate. When she took programming in the 10th grade, she found it hard to understand. But, "A year later, I saw how computers could help our farm and got interested right away." Leah's family has a 1,500-acre farm where they grow corn, oats, and hay, and raise dairy cattle. One of the ways she uses *VisiCalc* is "to help determine which of the cattle are most productive. Then we feed the cows on the basis of how much they produce."

Leah says, "I learned to write a program to compare our farm's output with others—and my father was really impressed."

HELPING OUT AT HOME

Leah's mother, Mary Jane Moen, is also a strong supporter of the Ortonville computer program. She likes how Leah's work "shows what the animals are eating and where to cut expenses." She also appreciates the work Leah does with the computer to maintain accurate tax records.

Parents said they had no qualms sharing family financial information with their children. The parents welcomed help in keeping the books, which had never been one of their favorite jobs.

Fifteen-year-old Mike Danielson's family has a 500-acre farm where they grow corn, beans, oats, and wheat. He believes computers are changing the way farms are managed. He talks about some of *F.A.R.M. AIDS*' decision-making routines: "Hog Planner," "Best Crop per Acre," and "Dairy Planner."

"Before computers, farmers averaged things out in their minds," Mike says. "Now you can use the computer to think about different approaches and select the one which makes sense to you."

LEARNING TO INNOVATE

The students learn how to adapt the spreadsheet programs to their specific needs. For example, some farm animals don't need to be fed; they graze. But the land costs money—for fertilizer, taxes, and perhaps mortgage expenses. Some students discovered that *F.A.R.M. AIDS* did not take into account these "pasture costs," and so they added them to the program.

Angie Nolting says the analysis she does on the school computer has helped her family make some very specific decisions.

"There are four kinds of feed: silage, hay, grain, and a high-protein concentrate. Their costs vary, and we can calculate the impact of putting more money into each kind. We also can factor in the costs of shearing, heating the barn, and depreciation. We saved a lot of money because of the computer, and hope to do even better next year."

The students agree that using spreadsheets aids them in other classes as well. "It helps you learn to think logically," says Angie.

Her mother, MaryAnn, agrees. "This is one thing she really sunk her teeth into. It's done more for her math skills than some of the math classes she took." She thinks Angie enjoys taking a more active role in her own education.

Angie's success has encouraged her 13-year-old sister, Kim, to ask the family to buy her a pig. She hopes to use the computer to make decisions on the animal's care and feeding. "She's seen what Angie is doing, and wants to do the same thing."

Angie and schoolmate Leah intend to continue using computers. Angie hopes to attend a nearby vocational-technical institute and study computers. She wants her own sheep farm someday, either in Minnesota or Montana. Leah has just received a "State Farmer" award from the Future Farmers of America, and quietly accepted Iverson's praise when he noted that the judges were very impressed with her work on the computer. She hopes to be able to buy a computer soon.

EQUAL ACCESS, EQUAL ENTHUSIASM

Angie says, "Everyone in this school is really into computers." She appears puzzled when she is asked whether men are more involved with computers than women are. "You don't hear anything like that here. Students help each other out all the time. It doesn't matter whether you are a guy or a girl—it's whether you know how to run the program."

In walking around the school, it's clear that almost everyone has found something exciting and useful to do on a computer, and not only in the agriculture program. It's this pervasive *use* of computers that helped build the pro-computer environment students describe. One student remarked, "When computers first arrived here six years ago, only 'nerds' used them. Now it's only the 'nerds' who don't like them."

The school's student body has already produced several master pro-

PLANTING THE SEEDS IN YOUR OWN SCHOOLS

Phillip Iverson, Ortonville's vocational agriculture education instructor, offers these tips to communities that want to begin their own agricultural education computer projects:

First, spreadsheets are likely to be the most useful tools for farmers, and should be at the heart of a farm computer curriculum. If a community is considering which computers to buy, it should make sure the machines are powerful enough to run spreadsheets—at least 64K.

After teaching the basics, schools should introduce students to "templates," programs that adapt standard spreadsheets to specific applications—in this case, farm applications.

"Don't be afraid to ask people what programs have been really useful, and which ones don't work so well," he says. "You can get a lot of money invested in something that won't fit your personal situation."

Meanwhile, Iverson says, schools should offer enough programming to allow students to write some of their own agricultural programs.

It's crucial to involve farm parents, who may be skeptical about computers. Iverson says, "Schools should allow farmers to use their computers in conjunction with evening classes." Schools should consider working with county agents, state employees whose job it is to help farmers. Together, they can purchase computers and make them available to farmers on a loan, lease, or rental basis.

For additional information on software Ortonville has produced, and on the school's program, write to Superintendent Burton Nypen, c/o Ortonville Public Schools, 20 N.W. Sixth St., Ortonville, MN 56278. The *F.A.R.M. AIDS* template for *VisiCalc* is available from Specialized Data Systems, P.O. Box 8278, Madison, WI 53708; (608) 241-5050; $75.

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HOME-SCHOOL CONNECTION

grammers. One of them, Curt Johnson, stayed on as a district employee after graduation, to create new computer programs. He has produced attendance, scheduling, grade recording, payroll, and finance programs, as well as a sophisticated school lunch accounting package.

Johnson has visited California's Silicon Valley and received job offers from several firms there, but he prefers to stay in Ortonville. He's currently helping to write a trigonometry program that will use both a videodisc and a computer. The idea is to make advanced math courses available to students in the smallest schools, even when nobody there is qualified to teach them.

The computing spirit is catching among teachers as well as students. Maybelle Kampen recently retired after teaching for 46 years. She discovered, however, that she "just didn't like housework much. I missed the kids." She welcomed Nypen's invitation to return to teach word processing in the school's computer lab. Every Ortonville elementary student uses the lab at least twice a week, and some use it more.

Another former teacher at the school has taken a strong interest in the field, and opened a local computer shop. The store has provided jobs for several graduates.

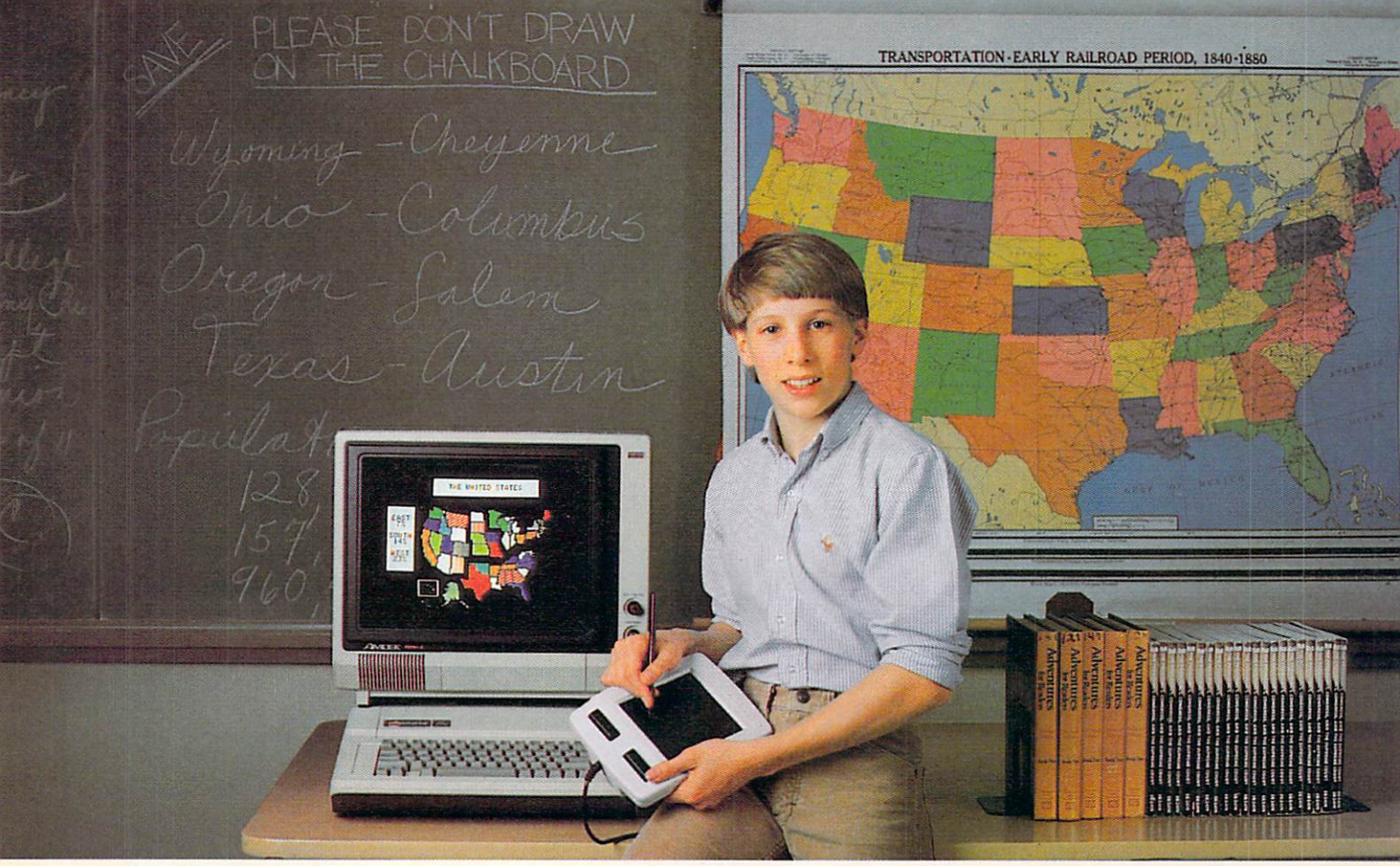
PARENTS APPROVE . . . AND JOIN IN

The students' work has improved the community's impressions of its schools. Some families see the introduction of computers as a way the schools are setting higher standards, and they like that.

Mary Jane Moen says, "The school is starting to push its students more. We think that's great. Using computers is one way to increase learning and to show students that the school treats them seriously."

It has also convinced many Ortonville adults to learn about computers. Nolting says many of his neighbors are attending computer classes at the school, studying the same topics as their kids. Farmers taking evening classes are welcome to use the school's computers, and both Iverson and Nolting agree that this has created a real bond between the school and community.

Nolting says his daughter's agricultural class "changed my view of school considerably. It helped me realize that school could teach my children things that would really help." FC



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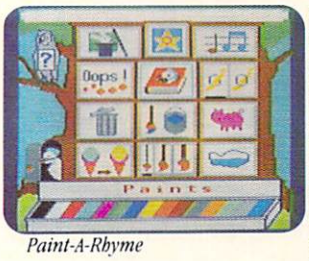

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HOME BUSINESS

KEEPING THE LINCOLN (ILLINOIS) LOG

The Strasmas tell how they run a national computer information service from their rec room

BY CONSTANCE GODDARD

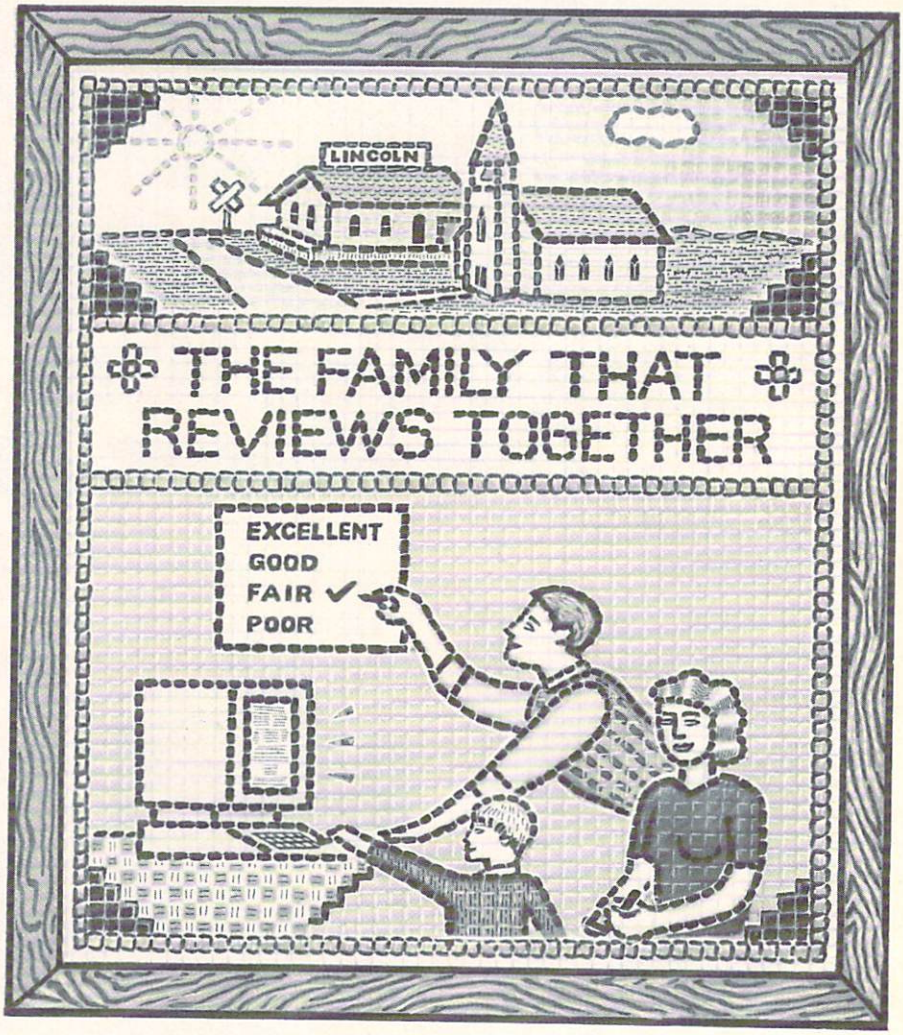

ILLUSTRATION BY JIM GRAVES

One of Amtrak's trains between Chicago and Kansas City is called the Ann Rutledge, and about 45 minutes before it reaches Springfield, Illinois, it stops in the town of Lincoln. Clients of attorney Abraham Lincoln founded the town in 1853. On the first day lots were sold, Lincoln split open a watermelon and spilled out its juice on the ground near where the railroad station now stands.

The original railroad station in Lincoln is now a comfortable, plant-filled restaurant, a symbol of how the town has adapted to the late 20th century. Among the town's 20,000 residents, two that have adapted especially well are Jim and Ellen Strasma. They're known to Commodore computer users around the country as the editors of the *Midnite Software Gazette*, a bimonthly compendium of fact, opinion, and reliable information about Commodore machines and software designed for them.

The Strasmas—Jim, Ellen, and 8-year-old Jamie—own five computers. Their large basement recreation room is filled with a half dozen disk drives, various monitors, two C. Itoh printers, a VICModem, and thousands of pieces of software, along with Commodore 64s, VIC-20s, and Commodore PET computers.

JIM'S NEW GADGET

Like most people in this new industry, Jim and Ellen didn't get into computing directly. Ellen began her career as a librarian in the early '70s, and spent some time computerizing a library's card catalog, while Jim was a divinity student in Boston. A self-confessed "gadget freak," Jim wasn't much interested in computers until he attended a church seminar in New York City early in 1977. "I knew Manhattan was famous for gadgets, and I was determined to find some." He happened upon a newly opened computer store, one of the first in the country.

When Jim told Ellen he wanted to buy a computer, her response was less than enthusiastic. "In six years of marriage, I had seen Jim take up one expensive hobby after another—cameras, stereos, gardening—now this." She eventually agreed to the computer, but insisted that no household funds be spent on it. So Jim, by now a minister, saved all the

Freelance writer CONSTANCE GODDARD *of Wilmette, Illinois, specializes in writing about computers and education.*

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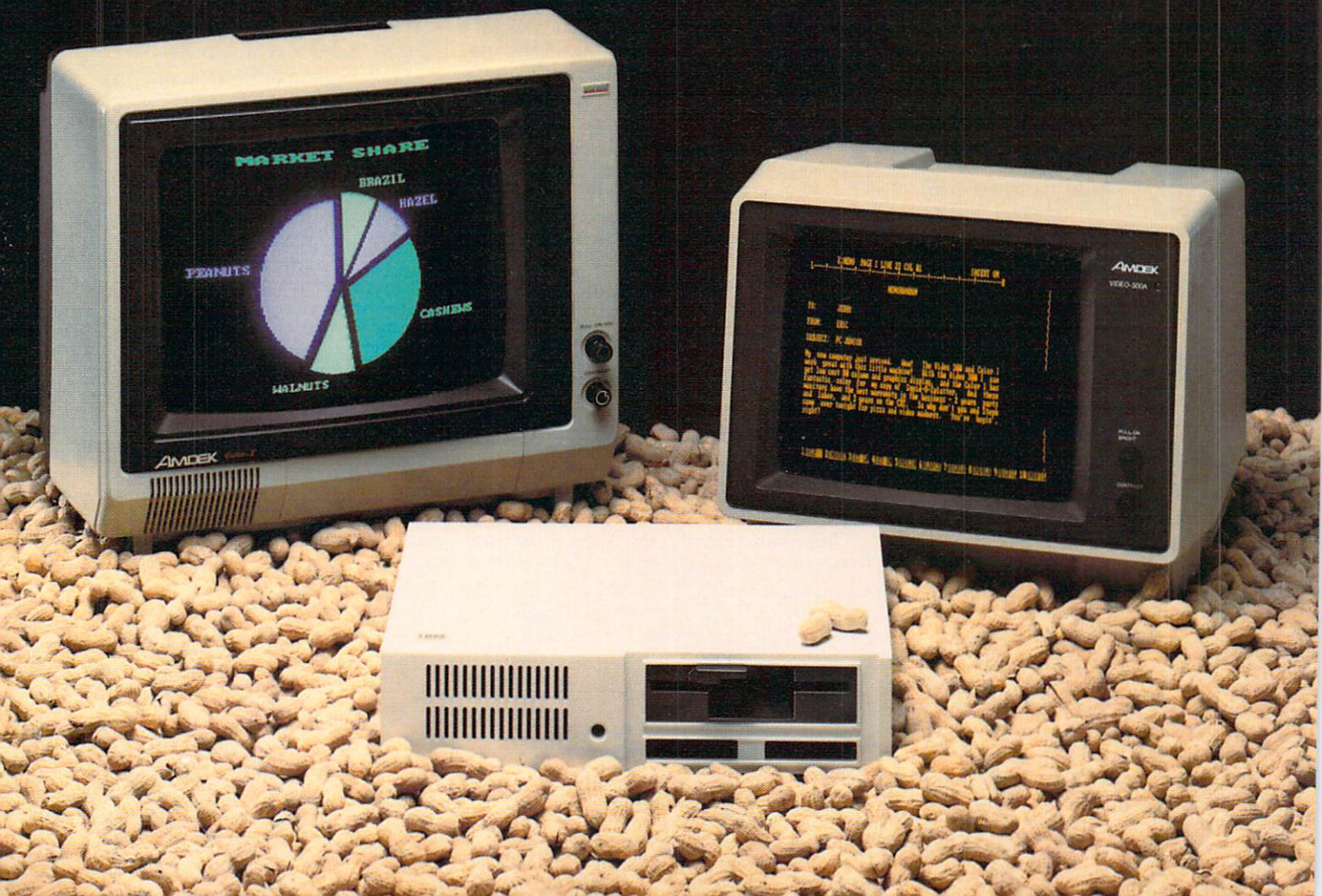

gifts he received for officiating at weddings and funerals until he could afford an 8K Commodore PET.

Ever-practical Ellen had another stricture on Jim's latest enthusiasm: This hobby had to pay for itself. Fortunately Jim had a practical outlet for his new skills. As minister of evangelism for a large Methodist church in Central Illinois, he was responsible for monitoring church attendance, and he wrote a program that helped him do so. In the days before disk drives this was no small feat, since it required juggling up to a dozen tape cassettes. Eventually he got a printer to produce membership lists. Then, he started writing sermons with a word processor, which saved him two hours a week.

FINALLY BREAKING EVEN

In 1979, Jim wrote and began selling *Subsort*, a program which lets Commodore owners use machine language instead of BASIC, to speed up the process of sorting information. His hobby began breaking even.

At the same time, he was becoming active in the community of Commodore users. With fellow Commodore owner Jim Oldfield, who lived nearby in Mt. Zion, Illinois, he organized a users' group. Soon, Oldfield and Strasma discovered there was no Commodore software review publication that they trusted. They decided to publish one themselves, and each put up $100 to start the *Midnite Software Gazette*.

Named "Midnite" because they produced its first issues late at night, it began as a single folded sheet of paper, distributed quarterly by fans who followed its injunction, "Copy me. I want to travel."

The *Gazette* quickly developed a reputation for being an outspoken advocate of high standards, both in software quality and support. It frequently chides "sinners," and commends those whose policies show integrity or foster the free exchange of ideas.

Jim's background as a minister may have something to do with a basic belief in an electronic Golden Rule: Customers should do unto vendors as they would have vendors do unto them, and vice versa.

On the vendor's part, that means better warranties. Some software manufacturers won't even promise their program will run when you receive it. Strasma disagrees with software companies that prevent users from making backup copies.

But if the vendor does its part, Jim Strasma believes the customer has a responsibility not to copy software for friends, or to seek refunds for disks damaged after purchase.

ELLEN GETS INVOLVED

As the *Midnite Software Gazette* grew, Ellen got into the business. The way Jim describes it, "I had gotten myself into a pickle by taking on more work than I could handle." And, as she had done before, "Ellen had to organize me out of it." For her part, Ellen decided that if Jim was going to spend all his working hours with computers, she would have to find a way to contribute.

Ellen quit the librarian's job she had taken when Jamie started school, learned word processing, and took over the expanding *Gazette*'s editing and production.

In the summer of 1982, the *Midnite Software Gazette* merged with *The Paper*, a newsletter for Commodore owners published in upstate New York. The *Gazette* incorporated, and started taking ads and subscriptions. Now Jim and Ellen Strasma produce it, and Jim and Debbie Oldfield handle the publishing end. Jim Oldfield also manages a computer store in nearby Champaign-Urbana, home of the University of Illinois.

Highly democratic in tone, the publication reads like an idealized town meeting. It welcomes contributions from anyone willing to sign their name, and hosts a healthy, continuing conversation about the merits of specific hardware and software, and the techniques of working with computers. It carries product rumors, requests for information, user group notes from all over, and software reviews.

The *Gazette* now has a press run of 4,500. And it reaches thousands more people every other month by being passed along hand-to-hand by subscribers.

HOW YOU CAN DO IT

Ellen Strasma offers some very specific advice for families interested in starting a software review service. First, you should get to know your local users' group. Chances are, it publishes a newsletter that would welcome your software reviews. (If it doesn't, that might be an opportunity to start one.) After you start publishing short reviews locally, polish them and approach a national magazine that specializes in the computer you're writing about.

"You've got to be good at writing," she added. "There are a lot more qualified programmers than there are people qualified to write. That's one reason we got into this end of it."

Ellen strongly advises cultivating a good relationship with your local computer store. If you are a loyal (and fortunate) customer, she says, the store may give you access to some new hardware and software for review without requiring you to buy it.

Since they began, Ellen has supervised three separate family moves to different homes. Jim is now on the faculty of Lincoln College on a special non-parish appointment. Lincoln is a small two-year school that

FAMILY LIFE AND FAMILY BUSINESS: MAKING THEM HAPPY PARTNERS

Here are some of the guidelines Jim and Ellen have devised to manage a business at home while they keep a hectic family life livable:

- Keep the computer close to the center of activity, not off in a corner somewhere. That will involve family members who might otherwise avoid the computer.
- If possible, locate your children's rooms near the computer, so your kids can get attention when they need it and easily see what you're doing.
- Decide what you are willing to give up. Movies, sports, TV, do-it-yourself projects . . . something has to go.
- Handle each piece of paper only once, making whatever decisions are necessary immediately, rather than putting it aside to clutter up your office.
- Keep only current issues of magazines. File articles you need and discard the rest.
- File things where you would think to look for them again.
- Try not to take on too many jobs you really don't want to do.
- Get an electric stapler, use a microwave oven, and take afternoon naps.

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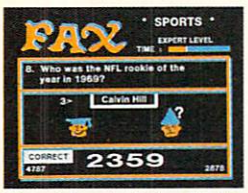

Chances are, you got the answer right. But not all the questions in this computer version of the popular Exidy Arcade Quiz-game are so easy. Can you name the only bachelor to become the President of the United States? Or identify what the initials stand for in O. J. Simpson's name? (If you guessed "Orange Juice," you *won't* score any points.)

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**Christopher Columbus*

started its computer science department with PETs. Ellen teaches part-time at the college too. Both work in an extension program at the local state prison.

In the past five years, the Strasmas have also written six books for users of Commodore computers—getting much of the information via contacts made through the *Midnite Software Gazette*. And Jim has developed and marketed four programs.

How do they do it all? "Organization," says Ellen. And she *has* organized their home to operate efficiently.

Computer equipment lines two walls of their rec room. Projects underway are stored in a set of cubbyholes, and next to them is the small copying machine they gave themselves for Christmas. What once was a bar now holds various incoming publications. On another wall is a luxury they indulged in last summer—a double-seated recliner where they sort mail and relax after long hours at the word processor. Together they decide what to file, what to dispose of, and whether to answer a question directly or in the *Gazette*.

JAMIE'S JOB

Though it is made possible by the latest in electronic marvels, theirs is very much an old-fashioned family business. When not in school or with friends, Jamie is as involved in his parents' work as any farm child in Lincoln's day would have been.

Jim and Ellen rely heavily on their son's reactions to games they review. When a new game comes in, Jim plays it for a half hour. Then Jamie takes over, aiming to beat his father's top score. Ellen sits by, with a Radio Shack Model 100 lap computer, typing Jamie's comments as he plays. Later, Ellen will record Jim's evaluation of its technical content, her reaction to its visual appeal and use of sound, and Jamie's comments on its playability.

Involving Jamie in game reviews gives the Strasmas a child's reaction; it also gives Jamie more attention than he would get if he weren't involved in the business.

Jamie has another job: He copies disks of the programs his father has written. Ellen systematized this process and supervises Jamie while she does her own work. When stock on a program runs low, Jamie gets a supply of new disks, and goes to the file for the master. Then he lines up special disk-mailing envelopes, labels, and miscellaneous envelope stuffers. He boots the masters, hits the appropriate keys, and watches the lights on the drive to be sure it is operating correctly. When the disk is copied, he readies it for mailing, with Ellen nearby checking unobtrusively. Jamie is paid a modest sum for his efforts; recent earnings went to purchase a new Lego set.

Jamie's computer sophistication hasn't yet affected his relationship with other second graders, who regard the family's panoply of computers as some elaborate variation on the game machines many of them have at home. The kids in awe of him are his father's students at Lincoln College—they know enough about computers to be impressed.

Jamie started learning to use computers at age two, when the first one arrived in their home. Jim wrote some simple games for him, and Ellen helped him with letter recognition on the keyboard when he began to show an interest. His parents are careful not to push him, and he is just now taking an interest in programming. After reading the book and running the program called *Gortek and the Microchips*, a child's introduction to BASIC, he asked his father to teach him about inputs. "Oh, I don't think you are ready for that yet," his father replied.

"Oh, yes I am," said Jamie, who says he also wants to learn to cook.

NEXT . . .

This summer Jim and Ellen are conducting a computer camp for grown-ups and advanced kids at Lincoln College, and teaching for a couple of weeks at The Chautauqua Institution, a summer community in Upstate New York. There they will be developing courses in word processing, data-base management, and spreadsheet use. Jim continues his work with Christian Computer-Based Communications, a bulletin board and software exchange for Christian religious groups.

How do they see the future? "As long as Commodore remains hot, we'd like to remain with it," Jim says. "It's always provided plenty of computing power at modest cost, and we've always wanted to help people who couldn't necessarily afford Apples and IBMs." Still, things may be getting a bit out of hand again.

"Today's mail brought 15 requests for help, and that's more than we'd ever really intended to handle." FC

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   - ☐ Allows functions that cannot be performed with a keyboard.
   - ☐ Programmable surface
   - ☐ Graphics/Music/Game Design/Versatility

3. **Which of the following uses of the Chalk Board PowerPad that have already been discovered do you think are most important? (Please rank 1-6)**
   - ☐ Graphics
   - ☐ Music composition
   - ☐ Game design
   - ☐ Special effects
   - ☐ Programming
   - ☐ Learning through discovery

4. **Which of the following uses of the Chalk Board PowerPad currently under development do you consider the most important? (Please rank 1-5)**
   - ☐ Free-form game play
   - ☐ Test preparation (SAT, ACT, etc.)
   - ☐ Custom video design
   - ☐ Laser disk control
   - ☐ Artificial intelligence

5. **What other uses can you imagine for the Chalk Board PowerPad.**

   A. _____

   B. _____

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COMPUTING CLINIC

TI SOFTWARE/ IBM PC MEMORY EXPANSION/ LOGO INFO

BY JEFFREY BAIRSTOW

I have a TI-99/4A computer and would like to know which other companies' cartridges will work in my computer. Will other companies continue to make cartridges for the 99/4A?

HELEN M. BEED
Tucson, AZ

A number of companies are continuing to offer cartridge, disk, and cassette software for the TI-99/4A. Software for the TI from Atari and Parker Brothers, for instance, is still available in some retail stores and from several mail-order companies. There seems to be a continuing demand for TI software so it's likely these companies will go on offering products. Unfortunately, a cartridge designed for another computer will *not* work with the TI.

You can obtain a catalog of both TI and third-party software from Microcomputers Corp., 34 Maple Ave., Box 8, Armonk, NY 10504; (914) 273-6480. This company also has a large stock of TI peripherals at discounted prices. Forty-Seventh Street Photo in New York City has a wide range of TI software in its retail store, and also sells by mail order: 115 W. 45th St., New York, NY 10017; (212) 260-4410.

Last year I purchased an IBM PC with 64K of RAM. I would like to expand the memory, but I don't want to buy an expensive memory-expansion card. Can I buy individual memory chips to install on the motherboard? How do I order the chips, and how much do they cost?

CHUCK LEFEBVRE
Carterville, IL

Your PC is most likely a PC II with room on the motherboard for memory expansion up to 256K. IBM sells RAM chips for the PC, but you can get a better price from mail-order houses or through computer-club group purchases. You will need nine 64K RAM chips for each 64K to be added to your computer system. If you aren't afraid to open up your PC, you'll find it's simple to install the memory chips. However, IBM will not service an IBM computer without IBM parts.

I have had success with 64K memory upgrade kits from PC Connection, 6 Mill St., Marlow, NH 03456; (800) 243-8088. The kits cost $59 for a set of nine chips (64K). Other mail-order companies offer similar kits at competitive prices.

Full instructions come with the kits. However, the pins on the chips are quite fragile and can be damaged by incorrect insertion in the motherboard sockets. I recommend you buy an Integrated Circuit (IC) inserter tool, available from any Radio Shack store for less than $10. The tool makes the insertion of the chips into the sockets much easier and safer.

You will have to reset the switches on the motherboard to accommodate the larger RAM. You'll find instructions for doing this in your IBM *Guide to Operations* manual. With a larger memory, your PC will be slower with its memory checks on power-up. This is perfectly normal, but a little annoying.

I recently purchased a home computer and plan to hook it up to my color TV set, which is of 1978 vintage. Will the computer damage my TV set? Would it be better to buy a monitor?

ELIZABETH PODOLSKY
Lake Elmo, MN

Using a home computer with your TV set should not cause any problems in normal operation. The connection is made through a small switch box—which most likely came with your computer—to the TV set's antenna terminals. Your home computer provides a signal, on one of the unused TV channels (generally channel 3 or 4), that is exactly like the signal received by your TV antenna. This is of such low power that it will not cause any damage.

A properly adjusted TV set is quite adequate for most home applications of a computer, particularly for playing computer games. However, if you wish to use your computer extensively for more serious activities, such as word processing or spreadsheet calculations, you might want a monochrome monitor for its better character definition. Such a monitor may require an additional circuit card inside your computer, however.

I am trying to teach myself and my children the Logo language on our Apple IIe computer. Do Logo users' groups exist, or is there some other way I can find information and new ideas?

PENNY JOHNSON
Baraboo, WI

Logo was developed as an educational project under the direction of Professor Seymour Papert at the Artificial Intelligence Laboratory at MIT. The Educational Computing Group at MIT has produced a series of publications about Logo. For a bibliography of these memoranda, send $1 to Liz Lawry at: The Educational Computing Group, MIT Laboratory for Computer Science, 545 Technology Square, Cambridge, MA 02139.

Also, check with your local Apple users' group to see if it sponsors a Logo Special Interest Group. *Computer Shopper* (P.O. Box F, Titusville, FL 32781) regularly publishes a list of users' groups nationwide. FC

JEFFREY BAIRSTOW, *an electrical engineer who lives in West Redding, Connecticut, was a founder and managing editor of* Computer Decisions *magazine. He has also taught math and computer science in England. His family, including two preschoolers, uses a variety of computers.*

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GAMES

GAMES PEOPLE PLAY
The State of the Art and Your Gaming Habits

BY JAMES DELSON

The past year has seen a major shift in computer gaming, and today's state of the art seems years ahead of where it was only 12 months ago. The arcade games we're seeing now are more complex than ever before. The role-playing adventures are more involved. Much game playing now requires the kind of problem solving you'd find in adventure games, combined with the hand-eye coordination of a shoot-'em-up.

This improvement is due, in part, to the nature of the computers being sold. Their increasing power has allowed more complex programs to be written. Games have also changed as audiences have become more adept at arcade and strategy skills, developed more refined gaming tastes, and demanded improved quality in programs for which they spend anywhere from $10 to $60.

The market has shifted towards games that make the player think as well as push the button. Popular text and text-graphic adventures include games such as the *Zork* series and *Suspended* (Infocom); role-playing adventures like *Ultima II* (Sierra On-Line) and *Ultima III* (Origin Systems), the *Wizardry* series (Sir-tech), and *Telengard* (Avalon Hill); and hybrids requiring arcade and strategy skills, such as *Combat Leader* and *Broadsides* (Strategic Simulations), the *Apshai* series (Epyx), *Flight Simulator II* (sub-LOGIC), *The Bilestoad* and *Aztec* (Datamost), *Archon* (Electronic Arts), and *Castle Wolfenstein* (Muse).

"Games have become a lot more intelligent," says Robert Woodhead, vice president of Sir-tech and co-designer of the innovative *Wizardry* series. "This means that the audience has to work harder, but it has resulted in a definite upgrading of game complexity, as well as a shift towards more sophisticated subject material."

Together with his team of playtesters, FAMILY COMPUTING*'s games critic* JAMES DELSON *plays over 50 games a week to unearth the most noteworthy programs around.*

THE PLAY'S THE THING

There's been a vast improvement in the general design of computer games across the board. Designers and programmers have learned how to milk the most out of the personal computer's memory.

Games with only one way of winning have been replaced by flexible programs that allow a multitude of possible outcomes. And one-time play has been made a thing of the past by design-it-yourself programs such as *Lode Runner* (see my review, page 114) and *Operation Whirlwind* (both by Broderbund), *Star Warrior* and *Crush, Crumble and Chomp!* (Epyx), and most of the sports and war games available from Avalon Hill and Strategic Simulations.

"Two years ago, we were limited to straight positioning shoot-ups," says Bruce Chadwick, a reporter who covers the computer-games industry for the *New York Daily News*. "Now, in games like *Blue Max* (Synapse), there's much more to do. You can take your plane up and down, right and left, even hold it stationary if you want. People won't buy games anymore if they're going to get bored with them after playing a few times."

THE GRAPHIC ELEMENT

"Game graphics have improved over the past year or two," says Jeanne Dietsch, president of Talmis, a leading market-research firm that specializes in personal computers. "But they're not going to get much better in the near future, at least not until laserdiscs become an integral part of home systems." Technologically beyond the reach of today's personal computers, the laserdisc is the heart and soul of such graphically superb games as *Dragon's Lair* and *Space Ace*, current favorites at the video arcades.

There have been outstanding graphics in such games as *Encounter!* (Synapse), *Pinball Construction Set* and *WORMS* (Electronic Arts), and *The Bilestoad* (Datamost), but because of limited computer power, the designers, much as they'd like to provide us with better visuals, are simply unable to do so.

The program that has best combined good graphics with an excellent play system is Bruce Artwick's *Flight Simulator*. It has set the standard against which all games are judged, "creating a fictional universe that's close to the real universe," as Chadwick says.

THE K'S THE LIMIT

"There's a limit to what you can do in a 48K environment," says Robert Woodhead. "We've come a long way from 2, 4, and 16K games, but this field is only just getting started. We've seen what's possible in really powerful programs [on big mainframes].We all want to be there today."

Today's designers have to work within the limits of today's machines. This means trading graphics for a powerful play system, which has been the route Infocom has taken with the complex interactive fiction that puts you in the pilot seat of a huge imaginary world. Or, trading game scope for playability, which is what designers of war games have had to do so players could move units in complex, strategic military maneuvers.

One thing is certain: Games today are better than they were a year ago; better than they were six months ago.

Games are of higher quality than ever before and more subjects are being tackled—from sports and politics to high finance and movie adaptations. And from where I sit, surrounded by seven computers and hundreds of games, it looks like the computer gaming field is alive and well and thriving on the millions of players who devote their time, money, and intellect in the pursuit of personal achievement.

Please turn to the Games Survey, page 34.

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THE SURVEY
FAMILY COMPUTING'S GREAT GAME GIVEAWAY

This is what I think about the state of the art in today's gaming field. What do you think? Fill out this questionnaire and let FAMILY COMPUTING know. Ten of the families responding to the survey will WIN UP TO FIVE FREE GAMES for their family's computer from the companies listed below. We want to know what you want to read about, what kinds of games you and your family enjoy, and how you enjoy them. We'll publish some of the results in the December issue, along with a wrap-up of the year's game developments.

Fill out this questionnaire, then photocopy it or cut it out and return it to "Games Survey," FAMILY COMPUTING, 730 Broadway, New York, NY 10003. Those families who respond by July 15, 1984, will be eligible for our SOFTWARE GAME GIVEAWAY. We'll pick 10 families at random and send them five games furnished by companies including these leading game-makers: ACTIVISION, ATARISOFT, AVALON HILL, BRODERBUND, CREATIVE SOFTWARE, ELECTRONIC ARTS, DATASOFT, EPYX, HESWARE, INFOCOM, MUSE, PARKER BROTHERS, RADIO SHACK, RESTON, SIERRA ON-LINE, SIR-TECH, SOFTSYNC, STRATEGIC SIMULATIONS, SYNAPSE, TEXAS INSTRUMENTS, TIMEX.

Your name: _____
Your age: _____ Male ☐ Female ☐

List name, age, sex of each family member, and a yes or no to indicate whether or not they play games on the computer:

_____
_____
_____

1. What brand of computer does your family own?
Apple II/II plus/IIe ☐
Atari 400/800/XL series ☐
Coleco ADAM ☐
Commodore 64 ☐ VIC-20 ☐
IBM PC ☐ IBM PC*jr* ☐
TI-99/4,4A ☐
TRS-80 Models I/III/4 ☐
TRS-80 Color Computer ☐
TS 1000/1500 ☐ TS 2068 ☐
Other: _____
Which storage device do you use?
Cassette ☐ Disk drive ☐

2. How many hours a week is your computer used for game-playing? _____

3. Are there limits set on the amount of time that family members may spend playing games? Yes ☐ No ☐
And are there any rules governing computer game-playing in your home?
Yes ☐ No ☐
If you answered yes to either question, please explain:

_____
_____
_____
_____
_____

4. What activities do you spend less time on since you started playing computer games? (Check all appropriate boxes.)
Watching TV ☐ Reading books ☐
Going to movies ☐ Playing sports ☐
Playing board games ☐
Other: _____
_____

5. How does your family play computer games?
Parents and kids play together ☐
One person plays at a time ☐
Parents play alone ☐
Kids play alone ☐
Other (please explain): _____

6. How many computer games does your family own? _____

7. How many computer games have you and your family purchased in the last three months? _____

8. How much do you usually pay for a computer game? _____

9. Who decides which computer games to buy?
Mom ☐ Kids (boys) ☐ You ☐
Dad ☐ Kids (girls) ☐

10. Who pays for the games?
Mom/Dad ☐ Kids ☐ You ☐

11. Name your family's five favorite computer games in order of preference:
1. _____
2. _____
3. _____
4. _____
5. _____

12. What kinds of games does your family like playing the most? (Check the appropriate boxes below.)

13. Do you and your family have favorite game designers? Yes ☐ No ☐
If you answered yes, name them:
1. _____
2. _____
3. _____

14. Do you and your family have favorite game-making companies?
Yes ☐ No ☐
If you answered yes, name them:
1. _____
2. _____
3. _____

15. Where do you and your family get your information about computer games?
Magazine ads ☐ TV ads ☐
Magazine reviews ☐
Friends and work associates ☐
If reviews, which magazines? _____
_____
_____

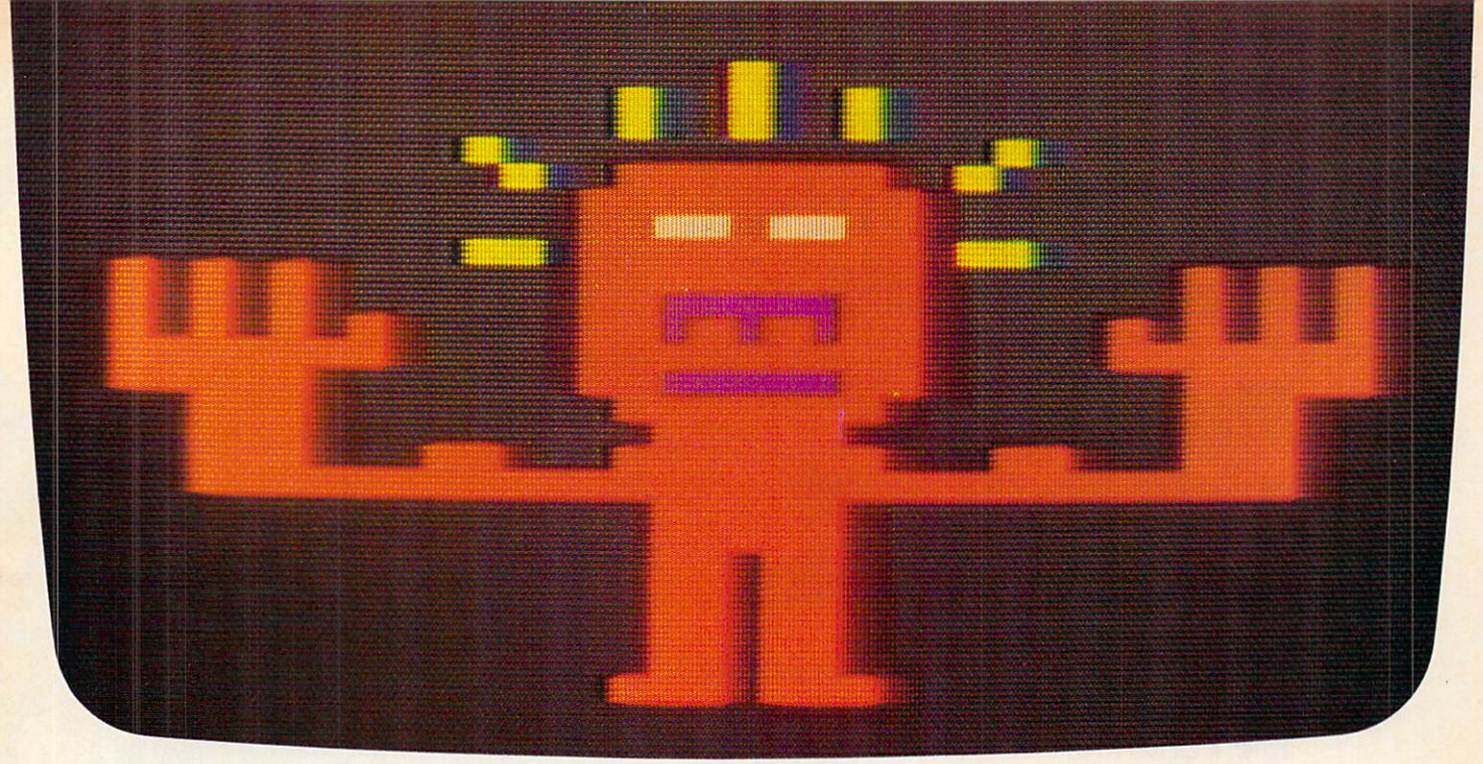
16. How can FAMILY COMPUTING's game reviews better serve you? For example, what kinds of games would you like to read more about? Less about? _____
_____
_____
_____
_____
_____

Please write your address and telephone number so that we can contact you in the event that you win in the SOFTWARE GAME GIVEAWAY:

_____
_____
_____
_____

Return to "Games Survey," FAMILY COMPUTING, 730 Broadway, New York, NY 10003.

TYPE OF GAME	Mom	Dad	Children AGE	AGE	AGE	AGE	AGE
Skill/Arcade (like *Pac-Man*)	☐	☐	☐	☐	☐	☐	☐
Text/Graphics Adventure (like *Blade of Blackpoole*)	☐	☐	☐	☐	☐	☐	☐
Role-Playing Adventure (like *Wizardry*)	☐	☐	☐	☐	☐	☐	☐
Strategy/Arcade (like *Archon*)	☐	☐	☐	☐	☐	☐	☐
Tactical/Strategy (like *Road to Gettysburg*)	☐	☐	☐	☐	☐	☐	☐
Finance/Resource Management (like *M.U.L.E.*)	☐	☐	☐	☐	☐	☐	☐
Simulation (like *Flight Simulator*)	☐	☐	☐	☐	☐	☐	☐



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If you think such an extraordinary experience is worth having, you're not alone. Everything we've ever written—ZORK® I, II, and III, DEADLINE,™ STARCROSS,™ SUSPENDED,™ The WITNESS,™ PLANETFALL,™ ENCHANTER,™ and INFIDEL™—has become an instant best-seller. For the simple reason that Infocom offers you something as rare and valuable as anything in software—real entertainment.

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(For more information on Infocom games contact: Infocom, Inc., P.O. Box 855, Garden City, NY 11530.)

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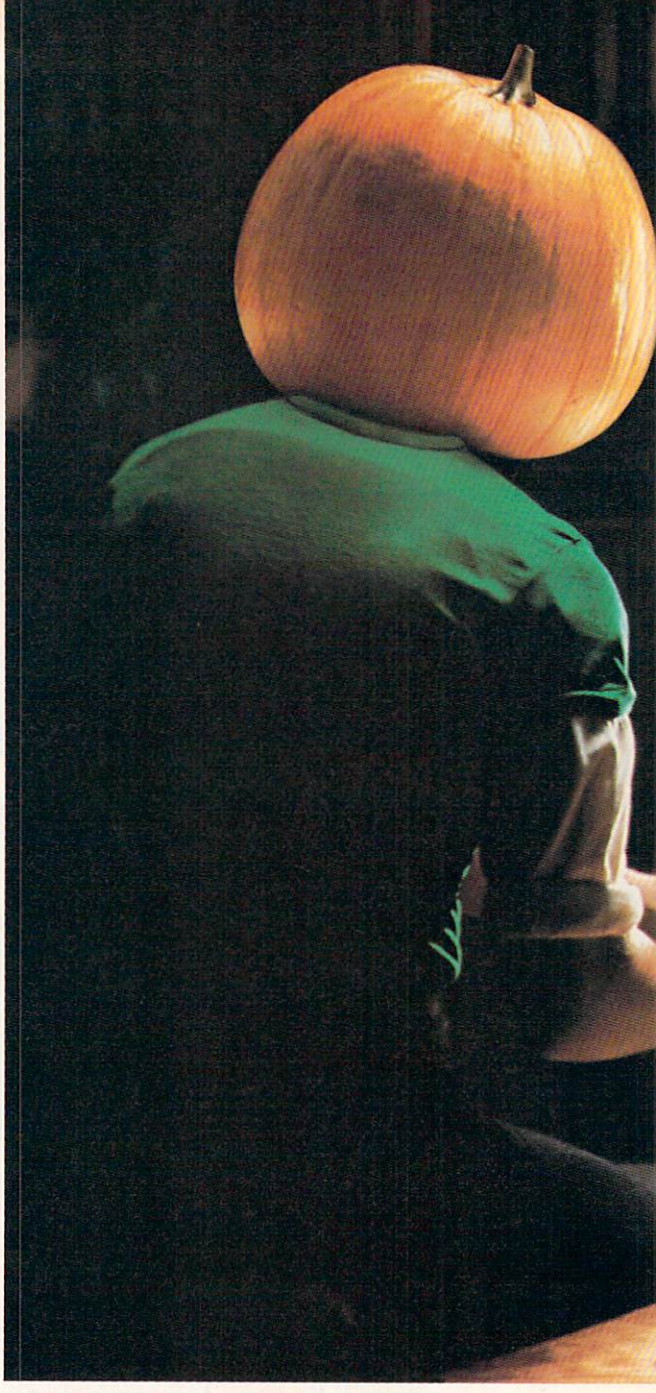

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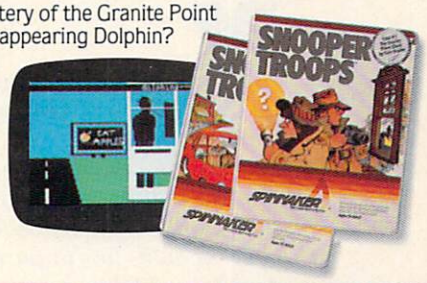

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Michael Berlyn

IT'S HOT, DRY AND DUSTY. YOU'RE PLAYING AN INFOCOM GAME. YOU LOOK FOR GRAPHICS. THEY'RE NOT IN THE PICTURE.

Marc Blank

BY ERIC GREVSTAD

You might pick up an Infocom game for its distinctive packaging—Starcross *comes in a plastic flying saucer;* The Witness, *a 1930s private-eye thriller, includes a newspaper and matchbook as well as a floppy disk. But the Cambridge, Massachusetts, company is best known for unparalleled programming. And for publishing games that use absolutely no graphics, just text.*

Zork, *written by MIT graduates Marc Blank and Dave Lebling, revolutionized the adventure-game genre by letting players use complex sentences instead of two-word commands. Other games that use* Zork*'s 600-word vocabulary and sophisticated parser (the part of an adventure game program that interprets input), such as the interactive mystery* Deadline *and sci-fi comedy* Planetfall, *have made Infocom the leading adventure publisher, and a more than $6-million-per-year business enterprise.*

FAMILY COMPUTING *went to Infocom's offices to interview Blank, now Infocom's vice president for product development, and Michael Berlyn, author of several novels and Infocom's futuristic smash,* Suspended. *The firm had just released its ninth and tenth games*—Enchanter, *the first in a trilogy of fantasies in the* Zork *tradition, and Berlyn's* Infidel, *a tale of drama set in the Egyptian desert.*

FC: How did *Zork* come about? I know *Colossal Caves,* Will Crowther's and Dan Woods' original adventure, was sweeping through

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ERIC GREVSTAD *is the news editor of* 80 MICRO. *He wrote "The Lure of Adventure and Fantasy Games" in the October issue of* FAMILY COMPUTING. *He has never found the safe in* Deadline.

computer labs in the mid-'70s. Did it sweep through MIT's?

Blank: Yes. *Colossal Caves* was the only adventure around. So after we played it and liked it a lot, we asked, "Why don't we do something like it?" So *Zork* was first written at MIT on a big mainframe computer.

The old *Zork* was very small, with just a two-word parser. We realized that was really very limiting, so we expanded the parser [so it could understand longer sentences] and invented new problems. Eventually *Zork*, between 1977 and 1979, got really, really large. It was just a hodgepodge of different sorts of things; whenever anyone had a good idea for a problem, we'd add it.

When we put the games on micros, especially *Zork II* and *III*, we tried to give them a plot, which the original didn't have at all.

FC: So now plot comes before problem.

Blank: That's exactly right. There's a plot, and then we say, "Well, what are the problems going to be?" In *Deadline*, for instance, we said, "Okay, the story is this, and this guy's dead, and these people are going to do this and that. Now, what's the game, what are the pieces of evidence and what can you do?" With *Suspended*, I think the characters came even before the plot. You had these different robots with different abilities....

Berlyn: The setting, the underground complex....

Blank: And then the question was: What are they doing?

Berlyn: Always a good question.

Blank: But you can see that the newer games are really all much better thought out. People that play them, I'm sure, will notice that they hold together much better. And it's because, even though they're changed a lot after the initial design, they're designed at one time—as opposed to over years by a number of different people with different interests.

FC: How does the design process work? What's the first step?

Blank: Someone who's finished with one project says, "I have an idea for this story." If it's something that we all think sounds reasonable, then they can come up with a synopsis and see if we like that; then they can go off and start. And as they're doing it, there's a lot of feedback from the other authors.

FC: There seems to be as much interaction here in the office as in the games. What's it like to work here? Is it a bunch of off-the-wall loonies playing around the water cooler?

Berlyn: For the most part, yes.

Blank: I think we're actually a bunch of relatively well-behaved loonies. I mean, we're loony enough to do what we do, but not so loony that we don't get things done. We understand that we're in a business.

Berlyn: We're professional loonies.

FC: I'm getting the impression of fun-loving game writers who are also serious businessmen. Who's your competition?

Berlyn: Hemingway?

Blank: Actually, we're our own competition at the moment, because we're internally driven to do something better or new each time.

Berlyn: All the loonies who write the games are easily bored, and no one wants to sit down and recreate what's already been created.

FC: People say the market's changing. Who's your audience? Is it male, female, professional, young, old?

Blank: Whenever anyone does a survey, you can look at it and say, "Oh, we have a very limited audience—young, college-educated, male, with incomes over $40,000." Then you look at the type of people who own computers and they're the same. You're really not getting any extra information; the question is, who owns computers?

Berlyn: We get letters and warranty cards from 10-year-olds, 50-year-olds, male, female, married, single. There's no way for us to say that no women like our games, no children can play our games....

Blank: Actually, it looks like a relatively high percentage of women play our games. The male/female ratio of computer owners is something like 10 to 1 or 15 to 1. For our games, it's more like 6 to 1.

FC: That brings up another point. You've been careful to have generic or nonsexist characters—the role you play in *Deadline*, for instance, is identified only as "The Inspector." But now, with *Infidel*, the protagonist's not only a man, but an obnoxious, unscrupulous one.

Blank: We didn't really have a choice on that, although all things being equal we wouldn't have wanted to do it.

Berlyn: The character had to be drawn the way it was in order for the story to work properly. We discussed at great length whether or not having a male character would interfere with any female player. The thing we kept coming back to is that women watch TV shows where men are the main characters, they read books where men are the main characters, and men do the opposite.

FC: What do you think your customers want? What are your most and least successful games?

Blank: *Zork* and *Deadline* sell well. They're often the first games like this [text adventures] people play. *Starcross* doesn't sell as well as

"AGATHA CHRISTIE WROTE ALL THE MYSTERIES THAT ANYBODY NEEDED TO WRITE."

Zork: is that because of the package, or because it's science fiction?

Berlyn: Or because of the weasel aliens? There's no way of knowing.

Blank: But we hear the same sorts of things from people that like all the games. They like the interactive nature of it, they like the stories and the puzzles, they like the attention to detail.

"PLANETFALL MADE SOMEONE WHO WAS PLAYING IT CRY. DID ZORK DO THAT?"

But, it's like owning a bookstore—you don't take science fiction off the shelves because people buy other kinds of books.

FC: One of your new games, *Enchanter*, is a fantasy like *Zork*, but one in which you use magic and cast spells. Is it fair to say you're taking on *Wizardry* [the role-playing adventure from Sir-tech Software]?

Berlyn: Not in any way, shape, or form. It's nothing like *Wizardry*. They don't look alike, they don't act alike . . .

Blank: *Wizardry* is for multiple players, multiple characters, the role-playing thing. It's mostly fighting and gathering treasures. It's similar because they're both fantasies.

Berlyn: They're similar in the way that *Pac-Man* is similar to *Zork*. They're both games. And they're a little more similar in that they're both fantasies. But when you're a publisher of this kind of fiction, do you say "We shouldn't publish a fantasy, especially if there's spells in it, because that's been done in *Wizardry*?" We certainly don't. If we did, we'd never have done *Deadline* or *Witness*. Agatha Christie wrote all the mysteries that anybody needed to write.

Blank: That's true. It's a different view of magic, too, I think. We're trying to build a progression. At the end of *Zork III* you become a magic user of sorts, so we thought it'd be nice to change the theme a little. So instead of being an adventurer, who just wandered into this crazy place, you've just graduated from magicians' school. And in *Sorcerer*, the sequel to *Enchanter*, you're a member of the circle of enchanters, and something's happened to the leader, and you go off and look for him.

FC: You've stressed the progression from game to game within a series, but $50 is a lot to pay for a game you play once.

Blank: If you can play the game only once, but play it for 30 hours and enjoy it, that's better than a game you play for two hours and then get sick of.

Berlyn: Books are expensive. How often do you reread a book? Also, some of the games you can play again and try to do better.

Blank: My guess is the average person who finishes a game has seen about half of what's there.

FC: That brings up the question of detail. You can read all the bottles in the medicine cabinet in *Deadline;* you can jump on the bed and it says WHEE! How do you second-guess people as to what they'll try to do?

Blank: Mostly, we write for ourselves, but we do spend a lot of time with testers seeing what they do. We definitely try to anticipate things; if there's a bathroom, you say, "Hey, someone's going to try to flush the toilet." That's more a frill, not really important to the story. But it's important to making the world we're creating a little more real.

Berlyn: You begin *Infidel* in your army cot in your tent; you can fold up the army cot and carry it around with you. That came as a result of a tester saying, "It's an army cot, army cots can be folded up." Now, some people say they want to be able to strip the cot of the canvas, boil it in water, and eat the canvas. But that's irrelevant to the story and unreal.

Blank: But something like waving at the plane may be relevant to the story, because you may want to be rescued.

FC: Even though it just dips its wings in reply and flies off.

Berlyn: Oh, you tried that?

FC: Some graphic adventures get more detail by using multiple disks. Would you consider doing that?

Blank: We'll have larger games. If in the future we're trying to do something ambitious, the "next thing," we may need to go to multiple disks. That's something that we're working on.

Berlyn: But it's not going to be a *Zork* with a glandular problem. We won't make a game bigger for the sake of making it bigger.

Blank: The larger the game is, the more it has to go to disk, the more disks you have to swap—the more tedious the experience.

Berlyn: You're not going to want to play an exciting, interactive game where your next

move may be life or death, and have to wait 15 seconds for swapping disks.

Blank: The idea is to make the computer invisible. You don't want to know you're dealing with a computer. You want to be interacting with the story, and anything that gets in the way, having to swap disks or communicate in two words, detracts from the experience.

The full-sentence parser doesn't improve the story; all it does is make it easier for people to get through to the story and interact with it. It's just a device, like a nice keyboard as opposed to a crummy keyboard.

FC: Here's a hostile question. I think *Zork* and *Deadline* and *Suspended* were like nothing anyone had ever seen before, great leaps or innovations, and I'm not sure I get that feeling from your new games. You have another trilogy like *Zork* [*Enchanter*], another mystery [*The Witness*], another science-fiction game [*Planetfall*], and so on. Aren't you playing it a little more conservatively?

Berlyn: Not at all. *Infidel* has things in it that no other game has ever had.

Blank: It's got an ending that . . .

Berlyn: Don't mention the ending.

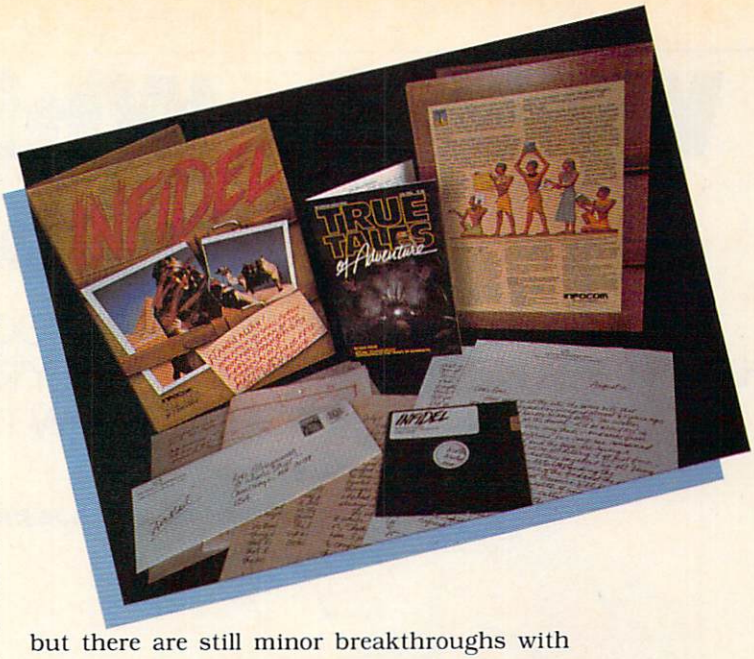
Blank: Well, I'll say something about it. It's the only game I know of where the ending is not a happy one, and in a way, you should have expected that from who you were, from your character. I think it's really revolutionary, because when people are done with it, they're going to think a lot about what's been happening. That's a little unusual. You know, it's not like you've gotten the last treasure and won the game.

Berlyn: It's the first game that's ever drawn the character clearly and in great detail, and then set that character out on a mission, and had an ending that is more consistent with literary conventions and reality than with a game. And for that reason it's less a game and more a piece of fiction. So I disagree that *Infidel* doesn't make any breakthroughs.

And look at *Planetfall*. *Planetfall* is the first story where I saw someone who was playing it cry. There are people who are really touched by that game. Did *Zork I* do that? And there are other things in *Planetfall*, too. Doing different things takes different amounts of time.

Blank: Which we were playing with. I mean, that's an experiment—the fact that taking something is quicker than walking from one room to the next, and that walking down a long corridor takes more time than walking down a short one.

Berlyn: And there are fewer suspects in *The Witness* because there's more that you can talk to them about. More interactions with the characters are possible. Those kinds of things may not seem as radically different as *Zork* did,



but there are still minor breakthroughs with every game.

FC: Are there any major breakthroughs left?

Blank: I think in a year we're going to see something that is to *Deadline* what *Deadline* was to *Zork*.

Berlyn: The new game changes the *type* of game; it doesn't just improve on an existing genre. What *Zork* was was *Adventure*, done as full-blown as it could be done—a full-sentence parser, and a big vocabulary. And *Deadline* changed what detective games were like—with characters that move around independently, whose lives you can affect, with time flowing through the story and with things happening whether you're there or not. The new game will be out early next year. Our kids' game [due in May] will also be very different.

"THE LARGER THE GAME IS, THE MORE IT HAS TO GO TO DISK, THE MORE TEDIOUS THE EXPERIENCE."

FC: *Time* magazine featured you in the December 5 [1983] issue, and said a lot of nice things about adventures and *Zork I*'s being the best-selling piece of recreational software [sales have now topped 250,000 copies]. Then they said, "By literary standards, Infocom's stories are crude. The characters are two-dimensional, plots are forever clunking to a halt, and the writing tends to be sophomoric."

Berlyn: That's very true. By "literary standards," 99 percent of the fiction published in the United States is crude, it's sophomoric. I won't argue with the *Time* quote. It's entirely accurate—and very unfair. Unfair, in that to be compared to "literature" at this point shows their total lack of understanding.

Blank: It's flattering that they think our work is close enough to literature to say that. I mean, I don't think they would bother comparing *Wizard and the Princess* to literature.

Berlyn: We're not upset by it.

Blank: We're going to put stickers on our packages that say "Crude! Clumsy!"—*Time* magazine. FC

Whistle While You Word Process

THERE'S A NEW CROP OF WORD-PROCESSING PROGRAMS THAT ARE PERFECT FOR FAMILY USE—THEY'RE INEXPENSIVE AND EASY TO OPERATE. HERE'S HOW THEY RATE.

BY CHARLES H. GAJEWAY

ILLUSTRATION BY CAROLE A. POPOLA

Just a couple of years ago, using word-processing software on a personal computer meant spending anywhere from $150–$700 for a disk or two and a manual that read like NASA design specifications. Then came 40 to 60 hours spent learning what seemed like hundreds of obscure command codes to make the 40-column computer screen work like an 8½- by 11-inch piece of paper. At last, the final curse: experimenting with a printer that seemed determined to turn your polished prose into a stream of quadruple-spaced gibberish. If you were a professional user faced with cranking out a constant stream of memos, reports, articles, or books, the effort was worth it. Once mastered, that cranky program could eliminate hours, even days of laborious cutting, pasting, and retyping, and let the writer concentrate on creating and polishing his or her work.

But, if all you wanted was to push out an occasional letter, store a boxful of treasured family recipes, or help your high schooler prepare a 10-page research project, it often seemed easier to dust off the old Underwood

CHARLES H. GAJEWAY *is an assistant vice president for Merrill Lynch & Co. in New York and a frequent contributor to* FAMILY COMPUTING. *He reviewed the new Apple Macintosh in last month's issue.*

rather than face relearning the endless complications of an overpowered computer system. A lot easier, cheaper, and more sensible.

MODERN TIMES

Eventually, however, some of the same software designers who had created programs to produce 10-year financial forecasts, draw perfect graphs, or sort through thousands of records simply by highlighting items on well-designed menus, turned their attention to word processing. Within the past year, programs that had a good balance of word-processing features, and were simple enough for young and inexperienced users to master, rapidly began to hit the marketplace to an enthusiastic reception.

In this article we take a close look at a number of these family-oriented word-processing programs, and see how well they deliver on their promises. A family package is defined as one that uses on-screen menus, is available for at least one major computer brand, and is priced at $100 or less. (Exceptions were made for programs that offered special value or unusual features for home use.) We've also included a comparative chart of features, a glossary of word-processing terms, and an explanation of how we judged the programs. *(For a review of MacWrite, the word-processing package included with the new Apple Macintosh, see the May 1984 issue of* FAMILY COMPUTING.*)*

THE SOFTWARE

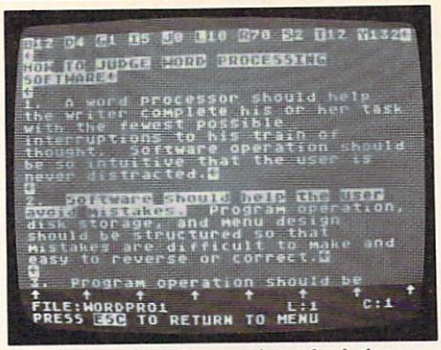
Editor's Note: Some of the following programs are designed to run on a variety of machines. Readers must remember, however, that different computers have different capabilities: e.g. screen displays, speed of operation, and additional features. Each program was reviewed on the computer noted under its title, and comments—both here and on the accompanying chart—about the program and its features are based on that machine's capabilities.

AtariWriter

HARDWARE: All Atari Home Computers (16K).

FORMAT: Cartridge

Although *AtariWriter* is not a menu-driven system, it is very well-designed, and relatively easy to learn and use effectively. It has mnemonic control commands and embedded formatting commands, i.e. special character sequences inserted into the text as you type, which allow you to control operations such as setting margins, underlining, and printing. These enable the user to achieve a considerable degree of flexibility within the limits of the 38-column display.



***AtariWriter* allows for a variety of printing formats. Here, highlighted text is marked for underlining.**

Cursor control is good, and local editing is fairly easy. The screen is crisp and clear, even on a color display. The main display contains a lot of information, and provides a message area for user prompts.

Formatting is also handled with control commands, which are very flexible and include very good printer-control facilities. Disk or cassette file handling is also accomplished easily and reliably.

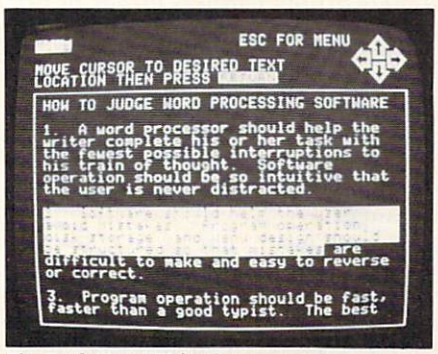
The manual and quick reference guide are excellent. Well written and organized, they will have even a neophyte user up and running very quickly—with a minimum of head scratching. They include plenty of illustrations and examples, and even do a reasonable job explaining printer-control codes, although a little more information would be nice.

I wish Atari had gone just a bit further and added menus and help screens to *AtariWriter*, to make it a truly outstanding product. As it is, it's a fine word-processing program for all but the youngest family members—and it is a good value.

The Bank Street Writer

HARDWARE: Reviewed on Apple II/II plus/IIe (48K). Also for Atari Home Computers (48K); Commodore 64; IBM PC (64K) and PC*jr* (128K).

FORMAT: Disk



***The Bank Street Writer* has on-screen menus to direct the user. Here, text is marked for repositioning.**

The Bank Street Writer, one of the first family-oriented word-processing programs, is a starkly streamlined program that has just enough features to handle most household writing and typing chores. Program operation is divided into three modes: TEXT ENTRY, EDITING, and TRANSFER, which handles disk and printing functions. Menus and instructions for operating and transferring between these modes always appear at the top of the screen, while text is enclosed in a "window" below. The screen display is very crisp and readable on a monochrome monitor, and adequately sharp on a color monitor or TV.

User support includes a neat, simple tutorial session, a special feature that permits you to customize a program to your system and set printing parameters, and a clearly written manual that is easy to read, though somewhat too brief. The most difficult and technical part of word processing for most users is working a printer, and *The Bank Street Writer*'s manual glosses over this area entirely too quickly.

The program is very easy to learn and use; first and second graders can master it readily, and anyone who has ever used a typewriter will feel at home very quickly. *The Bank Street Writer* is well suited to families with light to moderate word-processing needs, especially if grade schoolers will be using the system. However, its limited formatting abilities make it unsuitable for more sophisticated purposes and don't support user growth.

Cut & Paste

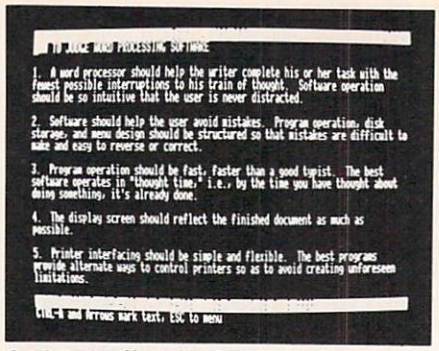
HARDWARE: Reviewed on Apple IIe (48K). Also for Atari Home Computers (48K); Commodore 64; IBM PC and PC*jr* versions expected soon.

FORMAT: Disk

Functionally, this program is very similar to *The Bank Street Writer*, but it has additional features which may make it more interesting to some users.

Cut & Paste locates the menu in a single line at the bottom of the screen. Another line at the top of the screen is reserved for prompts. Text or disk catalog information appears in a large central window, and the display is quite readable.

Cut & Paste operates through a menu as well as through direct commands, which speed up the process. Since menu-driven programs tend to be slower to operate but easier to learn than command-driven ones, it is considered good programming practice to include both styles when feasible. It benefits both the novice



***Cut & Paste* offers 80-column display.**

and the occasional user.

The program comes with a very clear, brief manual, and a quick reference card that refers the user to the corresponding page in the manual. There is no tutorial, but the document disk furnished with the program contains several model formats that are quite useful.

Cut & Paste would be most appropriate for general family use and for relatively simple tasks. While its formatting facilities are not powerful enough for advanced users, it is easy for young children to use effectively.

Electric Pencil

HARDWARE: Reviewed on TRS-80 Models I/III (16K). Also IBM PC/PC*jr* (64K).
FORMAT: Disk or cassette

Electric Pencil is the latest revision of a program that has been around a long time. While it attempts to reduce complexity by providing just a basic range of features, the program is almost completely command-driven and devoid of any sort of on-screen help. As a result, *Electric Pencil* is not particularly easy to learn or use, although it is superior to Radio Shack's *Scripsit* in this regard.

All the normal word-processing functions work well. While *Electric Pencil* does not have too many formatting features, it does include a number of valuable conveniences. The methods used to achieve boldfacing, underlining, and printer control, however, are extremely clumsy and should be avoided.

The manual is dense and somewhat haphazardly organized, but well written. It has plenty of illustrations, examples, an excellent glossary, and even an explanation of an effective backup plan to prevent the inadvertent loss of documents. In addition, two programs (*Red Pencil* and *Blue Pencil*) are available to correct spelling and provide a 50,000-word dictionary.

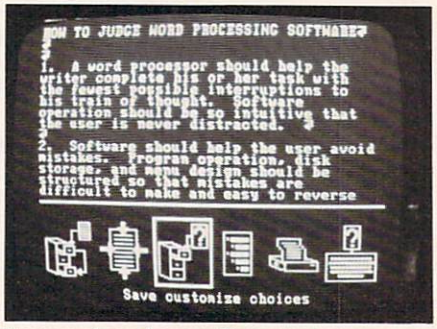
Until some more modern software becomes available for the "big" TRS-80s, *Electric Pencil* is the choice for family use, although it is not well-suited to young children.

HomeWord

HARDWARE: Reviewed on Apple II/II plus/IIe (48K). Also for Atari Home Computers (48K); Commodore 64; IBM PC and PC*jr*, (128K). IBM version sold through IBM.
FORMAT: Disk

An unusual feature of this program is that it uses icons, or pictures, to form the menu. I found the practical difference between using icons and text menus not to be significant; both are equally easy.

HomeWord's screen image is normally a clear 40 columns; final formatting can be previewed in 80 columns before printing. Approximately the bottom third of the screen is reserved for menus and instructions. *HomeWord* is a somewhat more complex program than either *The Bank Street Writer* or *Cut & Paste*. To keep things simple, the main menu is divided into four primary functions and two subsidiary operations. Each choice from the main menu brings up another menu; if you get lost or confused, you can simply press ESCAPE until a familiar screen comes up. All commands work simply, with instructions appearing on-screen as needed. There is occasional disk access as menus are changed; this sometimes slows down operations in a single-drive system.



***Homeword* uses icons as its on-screen menu.**

The program comes with a well-written and illustrated manual, a handy quick-reference card, and a helpful audio-cassette tutorial. Again, there is not enough explanation of printer controls for the novice; in fact, no mention of this important feature appears anywhere in the manual. It is mentioned only as the last item on the text entry side of the quick-reference card. A customer hot line number is provided in the troubleshooting section at the end of the manual.

HomeWord is not as easy to learn as the simpler programs, and is not as well suited to young children. Anyone who can understand *Donkey Kong*, however, can probably grasp the basics of *HomeWord* almost immediately. I would recommend this program over simpler ones for a family with more advanced needs, or concerns about buying software that provides room to grow.

OmniWriter

HARDWARE: Commodore 64.
FORMAT: Disk

While this program is not menu-driven, it offers so many features at such a low price ($70), that it would be of interest to a home user with advanced word-processing needs.

OmniWriter's command-driven operation is patterned after the Wang office word processor. It comes with a well-designed reference card and a function-key template which are almost as convenient as an on-screen menu system. The commands are highly mnemonic, and a help screen is available.

The program displays text as it will be printed using the standard Commodore 40-column display. This is accomplished by horizontal scrolling as the right edge of the screen is reached. This screen jump is a little distracting at first, but the user adjusts to it rapidly, and it is an effective way around the Commodore's video limitations. *OmniWriter* works smoothly and quickly, easily keeping up with the writer.

The basic operating mode is combined text-entry and editing; advanced users will find this convenient and quick, although beginners will be more error-prone until they get a feel for it. In this mode, the function keys are used to control large cursor movements and to initiate text insertion and deletion. Most editing commands consist of first pressing the COMMODORE key, then a letter or number. Printing and formatting commands are initiated with the CONTROL key, followed by a letter or number. In both cases, the letter of the key is generally the first letter of the command name, while numbers send predefined commands to the printer. It is a convenient and effective system which reduces memorization requirements considerably.

The extended formatting capabilities of *OmniWriter* can be performed very quickly, and the commands are represented on the screen as special characters, easily recognized by the user. The merge feature permits personalized versions of standard documents, a useful characteristic for many people.

The subsidiary spelling checker will compare the document in memory against a 30,000-word dictionary, and mark any words that are incorrect or not found in its listing. The user can add words to the dictionary.

Without menus or extensive

prompting for its full range of features, *OmniWriter* is more difficult to learn than the more family-oriented software covered here. While it definitely is not for young children, high schoolers probably could use it well. Despite not being state of the art, it is a good system and a good value. For a family with older children, or as a special program for an advanced user, *OmniWriter* is an excellent choice for Commodore owners.

Telewriter-64

HARDWARE: TRS-80 Color Computer (16K).

FORMAT: Cassette or disk

Like *Electric Pencil*, *Telewriter-64* is the latest revision of a program that has been on the market for some time, and, in this case, its age shows. It is not menu-driven, there are no help screens, and there is no prompting. As a result, the program is much more difficult to learn and use than most of the software evaluated here. Still, it was the best program we saw for the Color Computer, with a decent range of features and relatively mnemonic commands.

*(*Color Scripsit *from Radio Shack, unavailable at press time but promised to be back in stock for summer, is another popular alternative for the CoCo.* FAMILY COMPUTING *will be taking a look at* Color Scripsit *in an upcoming issue.)*

Telewriter-64's screen image can be adjusted to display 51, 64, or 85 columns on a standard TV. The image quality, however, is substandard. The screen will be completely blank until you begin to enter text.

Editing functions are command-driven. Most of the commands are mnemonic, and their action is fast and reliable. Cursor control is adequate, but small changes can prove a bit clumsy. The most annoying aspect of editing is that text insertions can open up gaps in the document. There is an ALIGN command which quickly removes these gaps, but can also destroy a carefully formatted table or text presentation; realigning text must be done with great care.

Print formatting changes are carried out with embedded commands. While this gives you considerable flexibility in determining how a document will look, this technique can be most distracting, and involves a lot of extra study.

The manual is a throwback to earlier days; a stack of loose pages originally printed on a dot-matrix printer. While it is reasonably well written, it is dense, long, and devoid of illustrations. There are, however, a lot of helpful hints, and a fairly clear explanation of printer-control codes. There is also a helpful reference card that neatly summarizes program operation.

Although its publisher says that *Telewriter-64* is being used in schools, its level of difficulty seems beyond the attention span of children up to high school age. It is a good choice for the CoCo, but it doesn't measure up to the newer software.

Textra

HARDWARE: Reviewed on IBM PC. Also available on PC*jr* (128K).

FORMAT: Disk

When using *Textra*, which is completely menu-driven, choices appear across the bottom of the screen, and are selected by pressing one of 10 function keys. Other than the menu, nothing else appears on the screen except for user-entered text.

Using the program is generally smooth and easy. Cursor control is good, if not as comprehensive or intuitive as in *WordVision*. Local editing is fairly easy, although marred by an insertion/reformatting operation that is intended to be flexible, but ends up being slightly confusing.

The disk menu is comprehensive, covering almost every possible SAVE or LOAD option. The only major omissions are saving parts of files, and looking at the directory of the current disk. This is most annoying, particularly when trying to recall an old file.

Overall, *Textra* is simple to use, and relatively easy to learn. It is not, however, as well designed and well integrated as *WordVision*, which is, in my opinion, the current standard of excellence for IBM word processors.

TI Writer

HARDWARE: TI-99/4A (48K).

FORMAT: Combined disk and cartridge

Since I'm not that familiar with the TI-99/4A, I turned to William Schick, a writer who's especially familiar with Texas Instruments prod-

A GUIDE TO WORD-PROCESSING TERMS

Block Operations: These permit the user to manipulate fairly large amounts of text, generally by marking the section of the document involved, and then specifying the operation to be performed. **Block move** removes the marked section from its original location and places it elsewhere. **Block copy** duplicates the marked section, leaving the original section intact. **Block delete** simply erases the marked section.

Chain printing: The ability to command your computer to print in succession several files stored on a disk or tape, so that when they are printed, they appear to be one large document.

Command-driven: Describes a program whose operation is controlled by special combinations of keystrokes. These commands frequently utilize the CONTROL key—which must be held down while another key is pressed, e.g., CONTROL-E to move the cursor to the end of the document.

Headers and **Footers:** Descriptive titles that appear throughout a document, and usually refer to the title or subject matter of the document, the author, date, page number or other subsidiary information. Headers appear at the top of the page; footers appear at the bottom.

Insert From Disk or Tape: The process of inserting text stored on disk or tape into a document at the cursor location. This permits new documents to be assembled from standard paragraphs, or material to be quoted from an old document into a new one.

Local Editing: Making small-to-moderately large changes, usually within a paragraph. Good local editing features—involving cursor movement, insertion, deletion, and formatting—are helpful in polishing text and adjusting formats.

Menu-driven: A type of program operated by choosing an action from a list or menu of available functions.

Merging: Also called mail-list, list-merge, and mail-merge, this feature allows standard documents to be personalized for a number of different recipients. This is a handy feature for organizations (churches, clubs) or individuals, such as salespeople, who need to send the same information to a large number of recipients.

Mnemonic Commands: Those commands given to your computer that are designed to be especially easy to remember, e.g. when the instruction to save a file is accomplished by pressing the CONTROL and "S" (for "Save") keys.

Page Break: That point in the text where a page ends. Occasionally, text will spread awkwardly across pages, leaving one or two lines trailing at the bottom of one page or the top of the next. This can be avoided by inserting a command at the appropriate point to begin a new page.

Printer Interfacing: The way that a program controls the function of a printer. Modern dot-matrix printers are often capable of a striking variety of print styles when given the proper software commands. How successful the user is in utilizing these features depends on how easy it is to pass the appropriate code to the printer at the appropriate time.

Search and Replace: Finds a specific word or phrase, and, at the option of the user, replaces it with another. This is useful for correcting spelling errors or for replacing a handy abbreviation with the full term. The SEARCH function alone is useful for finding a specific section in a long document.

ucts. Here's his report:

TI Writer, the only cartridge-based word-processing program available for the TI-99/4A, is not as new as other word processors reviewed here. It lacks some of the latest features, though it is flexible, and basic word processing is easy for all but the youngest children.

Like *OmniWriter*, *TI Writer* uses a 40-column display that scrolls horizontally to give you 80 columns in three overlapping "windows."

To begin writing, you select the TEXT EDITOR mode, which includes most of the features a casual user would ever need. Then select "E" (edit) from a short menu of one- and two-letter commands, and you're off. When you get to the right margin the line will word wrap (i.e. automatically begin the next line at the left margin). The top row of keys are used in combination with the FCTN and CTRL keys to perform the most common functions. A special plastic inlay strip reminds you which keys control

A GUIDE TO SOME POPULAR WORD-

Name	Manufacturer	Price	Hardware Requirements	Menus or Commands	80-Column Display Available*	Cursor Movement	Local Editing
AtariWriter	Atari, Inc. 1312 Crossman Road, P.O. Box 61657 Sunnyvale, CA 94086 (408) 745-2820	$99.95	Atari Home Computers, 16K (cartridge).	Mostly Commands	Can preview before printing	G	VG
Bank St. Writer	Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 479-1170	$69.95 $79.95 (IBM)	Reviewed on Apple II/II plus/IIe, 48K. Also for Atari Home Computers, 48K (disk); Commodore 64 (disk); IBM PC, 64K (disk); PC*jr*, 128K (disk).	Menus	IBM Only (required for PC*jr*)	G	F
Cut & Paste	Electronic Arts 2755 Campus Drive San Mateo, CA 94403 (415) 571-7171	$50	Reviewed on Apple IIe, 48K. Also for Atari Home Computers, 48K (disk); Commodore 64 (disk). IBM PC and PC*jr* versions expected soon.	Mostly Menus	Yes	G	G
Electric Pencil	IJG, Inc. 1953 W. 11th St. Upland, CA 91768 (714) 946-5805	$89.95 (TRS-80) $299.95 (IBM)	Reviewed on TRS-80 I/III, 16K (cassette), 32K (disk). Also for IBM PC/PC*jr*, 64K (disk).	Mostly Commands	IBM only (required)	G	G
HomeWord	Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858	$69.95 $75 (IBM)	Reviewed on Apple II/II plus/IIe, 48K (disk). Also for Atari Home Computers, 48K (disk); Commodore 64 (disk); IBM PC and PC*jr*, 128K (disk).†	Both	Can preview before printing	VG	G
OmniWriter	HesWare 150 Hill Drive Brisbane, CA 94005 (800) 624-2442	$69.95	Commodore 64 (disk).	Mostly Commands	Scrolls horizontally	VG	G
Telewriter-64	Cognitec 704 Nob Ave. Del Mar, CA 92014 (619) 755-1258	$49.95 (cassette) $59.95 (disk)	TRS-80 Color Computer, 16K (cassette or disk).	Mostly Commands	Yes	VG	F
Textra	Ann Arbor Software 407 N. Main St. Ann Arbor, MI 48104 (313) 769-9088	$95	IBM PC/PC*jr*, 128K (disk).	Menus	Yes, required	VG	F
TI Writer	Texas Instruments P.O. Box 53 Lubbock, TX 79408 (800) 842-2737	$99.95	TI-99/4A, 48K (disk and cartridge—*both* required).	Mostly Commands	Scrolls horizontally	G	G
WordVision	Bruce & James Program Publishers, Inc. 4500 Tuller Road Dublin, OH 43017 (614) 766-0110	$79.95	IBM PC, 96K (disk).	Menus	Yes, required	E	E
Write Now!	Cardco, Inc. 300 S. Topeka Wichita, KS 67202 (316) 267-6225	$39.95 (VIC-20) $49.95 (Commodore 64)	Reviewed on Commodore 64 (cartridge). Also for VIC-20, 5K (cartridge).	Mostly Commands	Can preview before printing (Commodore 64 version)	VG	VG
Totl. Text 2.5	Totl. Software, Inc. 1555 Third Ave. Walnut Creek, CA 94596 (415) 943-7877	$34.95 (cassette) $38.95 (disk)	VIC-20, 16K (cassette or disk).	Both	Yes	VG	VG

KEY TO ABBREVIATIONS

E = *Excellent: extra features plus easy to use:* **VG** = *Very good: extra features or easy to use;* **G** = *Good: normal ease of use and reliable;* **F** = *Fair: a slight deficiency in ease of use:* **P** = *Poor: unreliable operation or extremely difficult to use:* **N/A** = *Not available.*

which functions, making on-screen help largely unnecessary.

Other menu commands allow you to store or retrieve files, set margins, search and replace, or cut and paste. *TI Writer*'s cut-and-paste function is not the most convenient, but overall the system is sensible and unobtrusive.

TI Writer's manual is good as a reference source, but not very friendly to the beginner. It covers *TI Writer*'s more-than-adequate formatting and printer controls, but it definitely is not aimed at schoolchildren. However, anyone who figures out *TI Writer* can teach the rest of the family how to use it productively in about 20 minutes. And once you know how to use it, *TI Writer* becomes more or less invisible, as any good word processor should.

PROCESSING PROGRAMS

	FEATURES								
Block Delete	Block Move	Block Copy	Search & Replace	Tab	Boldface & Underline	Printer Control	Headers & Footers	Insert From Disk or Tape	Chain Print
G	G	G	22-character limit	G	Underline Only	G	G	VG	G
G (15-line limit)	G (15-line limit)	None (Done via disk files)	VG	N/A	IBM only	IBM only	G (Headers only)	VG	N/A
E	E	VG	VG	G	N/A	N/A	N/A	N/A	N/A
G	G	G	G	F (TRS-80 version fixed every 8 spaces.)	P (Clumsy)	P	G (Headers only)	Only at end of text	N/A
E	VG	VG	VG	VG	G	VG	G	VG	N/A
VG	VG	VG	VG	VG	G	VG	VG	VG	G
G	G	G	G	G	Must use printer codes	G	G (Headers only)	Only at end of text	G
G	G	G	G	F (Fixed every 8 spaces)	G	F	G	VG	N/A
G	G	G	VG	VG	VG	VG	G	F	G
E	VG	VG	G (Very easy, but slow)	VG	E	E	G	VG	N/A
G	G	G	18-character limit	G	Must use printer codes	VG	VG (But fairly complex)	Only at end of text	VG
G (255-character limit)	N/A	N/A	N/A	VG	N/A	N/A	VG	N/A	N/A

**Only those computers that have 80-column capability will support this feature.*
†IBM PCjr version published by IBM Personal Computer Division, P.O. Box 1328, Boca Raton, FL 33432, (305) 272-2662.

Totl. Text 2.5

HARDWARE: Commodore VIC-20 (16K). Another version of this program, *Totl. Text 2.6*, is available for the Commodore 64.

FORMAT: Disk or cassette

The VIC-20 is not a machine many people think of for word processing, but Joycelyn Sue Woods, a psychologist who bought a VIC-20 in 1982 to use for writing, filing, and keeping research notes, reports here on one program she finds especially suited to the home market.

Totl. Text 2.5 (*TT*) is a small, but powerful word processor, with many features included in larger, more expensive programs. Since it is written in BASIC it can be slow, but this allows the inexperienced user to easily make backup copies, or lets those with programming experience modify the software.

The documentation is easy to understand and well organized for reference. A chapter of the manual devoted to printers clearly explains how to customize *TT* for non-Commodore printers. The manual also includes a four-page reference card, which is almost unnecessary since most of the commands are so logical and easy to remember. It only takes about an hour to become proficient in entering and editing text.

TT stores its text files in blocks of 255 characters and displays two blocks at a time, in a split-screen format. The block you are working on is displayed on the bottom half of the screen, while the top of the screen shows the last 255 characters of the previous block. *TT* supports embedded commands, many of which can be found in higher-priced word processors.

The one major flaw of *TT* is in its handling of large text files. It's cumbersome to move around blocks of text, which can be particularly troublesome to writers who often rewrite, edit, and insert paragraphs into their text. Another problem is that the menu options are severely limited and there's no catalog of your text files available. You'll have to keep track of your file names with paper and pencil records.

Although *TT*'s promotional material claims that it is a complete, professional word processor, I believe it's best suited to family use at home. The software can handle simple business letters and forms, and is excellent for high school students to use in writing term papers and reports.

Younger children may require more time to learn the program, but should not have too much trouble operating it.

WordVision

HARDWARE: IBM PC (96K). PC*jr* version expected soon.
FORMAT: Disk

WordVision is a full-featured word processor that uses help screens, variable-function command keys, stick-on color-coded key labels, and extensive screen prompting to achieve exceptional ease of operation. (80-column display is recommended.) The manual is comprehensive and fairly well written (although occasionally a bit dense), but once the extensive set of cursor movement and deletion keys is mastered, most of the program is self-explanatory.

Entering and editing text with *WordVision* rapidly becomes as effortless as the thought process; operating the software becomes as natural as driving a car. More than with any other program I have tried, using *WordVision* is writing, not word processing.

While very young children would have some difficulty learning *WordVision* because of its variety of features, I think that a fourth or fifth grader should be able to handle it quite adequately. For those families with an IBM computer, *WordVision* is an outstanding bargain and a valuable resource.

Write Now!

HARDWARE: Reviewed on Commodore 64. Also available for VIC-20 (5K).
FORMAT: Cartridge

Write Now! is a full-featured word processor on a ROM cartridge, a boon to the many Commodore owners who do not have a disk drive. While it is not a menu-driven program, it is relatively easy to use; its commands consist of using the CONTROL or COMMODORE keys in combination with a number key. Between the keyboard labels that are supplied, and a series of built-in help screens, you should be able to get going quickly, although the program is probably too advanced for young children.

The display is the root of *Write Now!*'s biggest problem. The program makes no attempt to get around the 38-column display, except for allowing you to preview the text in 80-columns before printing. Formatting changes in the final copy are handled via embedded print commands, a technique that is effective, but which requires extra learning and tends to be distracting.

Cursor controls are good and local editing is smooth. An additional convenience is the facility to set "place markers" in the text, so that you can easily get to specific places in a long document.

The manual and user aids supplied with our review sample were preliminary, and may not reflect the final versions. Nonetheless, they were quite good, if a bit short on illustrations. The help screens were also useful, but it was a little annoying to have to go through all of them to get back to the program. The manufacturer also publishes a spelling-check program (*Spell Now!*) that will interface with *Write Now!*

While the program could be easier to learn and use, it is a good package, and would be a fine choice for diskless Commodore systems.

BUILT-IN SOFTWARE

With computers like the Coleco ADAM, the TRS-80 Model 100, the Epson QX-10 and 20, and the forthcoming Commodore 264 and 364, a growing trend is to have software built right into the computer itself. If the programs built into the ADAM and the TRS-80 Model 100 are any indication, this type of software will resemble the simpler family packages such as *Cut & Paste* and *The Bank Street Writer*, with the added advantage of being instantly available at the push of a key.

To date, such programs stress simplicity and convenience over feature variety and power; this makes them more useful to a wider audience at the expense of appealing to more advanced users. Those who need greater power will still have to buy accessory software, but at least they won't have to buy a simple program as well.

THE LAST WORD

These evaluations clearly demonstrate that there are some truly inexpensive and impressive word-processing programs available for family use. Even the simplest of them is a powerful addition to a home software library, and will receive heavy use over the years.

While it is important to choose software that meets your needs, the reasonable cost of these programs makes the future step up to newer and better packages seem less like abandoning a major investment. A family could even own two of these programs—a simple one for the kids and for casual use, and a more comprehensive one for complex work—without approaching the price of some of the older systems.

(Editor's Note: Creative Writer, *a new word-processing program from Creative Software, was unfortunately not available for review at press time. Based on an early glimpse of a preproduction version, we'd say that those who own a Commodore 64, IBM PC, or* PCjr *might want to consider the program when it is released. Stay tuned to* FAMILY COMPUTING *for a review in a future issue.)* FC

HOW TO JUDGE WORD-PROCESSING SOFTWARE

The evaluations in the accompanying article were based on a reasonably objective set of criteria aimed at defining what separates good word-processing software from the rest. This definition comes from long and sometimes bitter experience with these programs; a perfect program would meet each one of these criteria 100 percent. To describe them briefly:

1. A word processor should help the writer complete a task with the fewest possible interruptions to his or her train of thought. Software operation should be so intuitive that the user is never distracted. Menu-driven programs that have extensive user prompts tend to be best at this, though they can be slow. Command-driven programs are faster, but require help screens to minimize distractions.

2. Software should help the user avoid mistakes. Program operation, disk storage, and menu design should be structured so that mistakes are difficult to make and easy to reverse or correct.

3. Program operation should be fast—faster than a good typist. The best software operates in "thought time," i.e., by the time you have thought about doing something, it's already done.

4. The display screen should reflect the finished document as much as possible. Certain types of formatting can be very difficult to create on 40-column display screens, which is a major problem for users, particularly neophytes.

5. Printer interfacing should be simple and flexible. The best programs provide alternative ways to instruct printers to format your text (e.g. underline, boldface, set margins, etc.), so as to avoid creating unforeseen limitations.

6. Seldom-used program parameters should be tucked away out of sight until the user summons them. But they should be well-documented and carefully structured so that changing them doesn't require hours of research and experimentation.

7. A good manual is no substitute for intelligent program design, but a poor manual is a disgrace. Operating manuals, help screens, and tutorials should be clear, well illustrated, thorough, and as brief as possible.

BASIC BOOTH

SCREEN SHOT BY WILLIAM P. GALLAGHER

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Looking For A Summer Job?

TEN WAYS TO EARN $$$$ WITH THE HELP OF YOUR COMPUTER

BY EUGENE ARONIN

If you have a computer, a summer job may be just within reach. All you need is a little imagination.

First, sit down with a paper and pencil and jot down every service you could offer with the help of your computer. Next, make a list of everyone you know. Start with the people closest to you. Does your brother need reports word processed? Is your cousin in need of programming lessons?

Even if you have to venture outside the home to land a summer job, the same approach still applies: list your services, then your possible employers. Don't overlook small stores, local community centers, or the neighborhood church. Then get the word out.

Tell everyone: your parents, your relatives, your neighbors, and friends, and even your teachers, about what you want to do. Use your computer to print out fliers and hang them up on bulletin boards in computer stores and schools, shopping centers and recreational centers. Distribute leaflets to local merchants. Consider advertising in the local newspaper.

Recent publicity about computers has led to an increased awareness and desire for them. Be prepared during an interview to discuss the benefits of using a computer. Don't be shy. Remember that computers are a new field, and often the young kids know more than their elders. Demonstrate a variety of services you could offer. Show samples of your work.

If you're looking for jobs that already exist, scan bulletin boards in computer schools and stores, approach people at users' groups, or ask your computer teacher at school. Don't defeat yourself before you begin by assuming you are underqualified. While a general understanding and proficiency with computers is necessary, you don't have to be able to assemble a computer blindfolded.

If all else fails, consider volunteer work, which may not only help you land a paying job next summer, but can offer unexpected rewards. You may meet people who can open up new horizons. You may discover skills you never knew you had. And, best of all, you may find new ways of enjoying a computer.

1 **Work in a computer store.** A familiarity with computers, combined with the flexible hours of a student, might make you just the person to help out at your local computer store or in the computer section of a nearby department store.

2 **Assemble computers.** Help a family or a busy, small-business owner unpack and set up their computers. (Advertise your service on the bulletin board of a computer store.) Your familiarity with computers will make you an invaluable interpreter of the often-confusing docu-

EUGENE ARONIN *teaches courses in computer utilization at the National College of Education in Evanston, Illinois. He recently contributed to a textbook on computers for Holt, Rinehart & Winston, and is a freelance consultant for educational software companies.*

mentation that accompanies a machine. If your work is satisfactory, you may find you have an ongoing job, as new peripherals are purchased.

3 Conduct computer classes. Give lessons from your home or through classes offered by computer schools, stores, libraries, or community centers. Offer instruction in programming, in computers in general, or on your own machine in specific (you might consider setting up a troubleshooting hot line for your machine). Tutor kids with their computer class homework, or teach them the ins and outs of a popular game. Give art or language classes with the aid of commercial software.

4 Earn money programming. You don't have to write a best-selling computer game to make money programming. Software companies often have need of skilled and experienced people to translate programs for different machines, or to write documentation. (Consult your phone book for names and addresses.) Get started by offering personalized programs to friends, family, and neighbors. Write a music program for a birthday party, a program that prints out personalized wrapping paper, or an inventory program for a home owner.

5 Rent out your computer. Offer your computer and/or your software as a service to party hosts, individuals in need of specific games or utility programs, or families considering purchasing a computer.

6 Word process. Typing services can open the door to a multitude of jobs. Word process resumes, school reports, newsletters, etc.

IF YOU HAVE A COMPUTER, A SUMMER JOB MAY BE JUST WITHIN REACH.

Left to right: Julie Petrikas, Mike Parchomenko, Craig Rice, Abigail and Stephanie Hoit, and Rick Parada

ILLUSTRATION BY DAVID RICKERD

7 Maintain and update mailing lists. Help small businesses and organizations keep their mailing lists up-to-date. Don't overlook the needs of your family and friends in this department either; you may discover an uncle who would love to have his personal or office Chrismas card list computerized.

8 Design labels. Small stores that regularly rotate goods, such as a candy store, often have use for attractive, neat labels. Design some with a variety of border and type designs, then present them in an attractive portfolio. (See *Disk Label Maker*, page 74.)

9 Run a neighborhood service. Summer is an ideal time to pick up extra money watering lawns and collecting newspapers for vacationing neighbors. Set up a neighborhood service, using your computer to maintain schedules for a large number of clients. Or consider organizing a year-round neighborhood dog-walking or baby-sitting service, and employ kids in your neighborhood.

10 Babysit with software. Use your collection of computer games to become the most popular (and wealthiest) babysitter on the block!

If these suggestions aren't tailor-made for you, use them as a springboard to new ideas. With a little thought you should be able to come up with a multitude of ways in which you can earn money with your computer this summer. Here are five kids who succeeded:

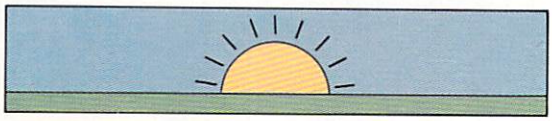
WITH A LITTLE THOUGHT, YOU SHOULD BE ABLE TO COME UP WITH A MULTITUDE OF WAYS IN WHICH YOU CAN EARN MONEY WITH YOUR COMPUTER THIS SUMMER.

Rick Parada, 17, started making money with his family's Apple II plus three summers ago, when his mother paid him to write five programs for her silkscreen T-shirt printing business (recently sold) in Pinole, California. "Large groups would send in orders and it became time-consuming to write the amounts by hand," explains Rick. So he wrote a program that would quickly sort and add up the orders, allowing his mother to present a computer printout to the supplier. Another program Rick wrote helped calculate the retail prices according to sales volume and expenses.

The following year, Rick was hired to work at Computerland, an international franchise. "I brought in listings of programs I had written to kind of prove my computer ability," recalls Rick. It didn't hurt that his math teacher (who was paying him to write a grade-averaging program) put in a good word on a visit to the store. "She said, 'He's teaching me to program!' " Rick suggests to job seekers: "Dress very nice and present yourself in a professional way. Anyone who's fairly familiar and comfortable with a computer shouldn't have much trouble. Being an expert in programming isn't a necessity."

Rick now works Saturdays and during the summer months in Computerland's accounting department and acts as a programming troubleshooter for customers. He started teaching beginning BASIC classes to clients on weekends during his second summer at the store, and he provides various other services when they're needed. One day, while keeping track of daily and monthly sales for individual salespeople, Rick suddenly became aware that he was "using ledger paper and a ruler and a calculator," and he thought, "This is crazy! This is Computerland!" So he wrote a program to accomplish the same task on computer.

"My whole life has been centered on the computer, ever since we got one," says Rick, who plans to "go into robotics" when he graduates. Rick's interest in programming is beginning to pale since all it is, he says, "is watching a screen pull up files and data you put in before. It all gets pretty boring watching a screen. Whereas with robotics I get to adapt the computer to the real world." He is currently in a school club that is "building a robot with six legs!"

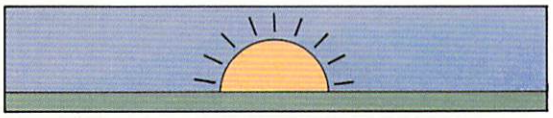


Stephanie Hoit, 15, is working this summer at Park Avenue Bootery in Glencoe, Illinois, where she is paid by the hour to enter the store's mailing list and inventory records into a computer, in addition to her regular duties as shoe salesperson and cashier. "They [the store owners] just got the computer recently, so they don't know anything about it," says Stephanie, who discovered computers at age 12 when her family bought a TRS-80 Model III. (They've since acquired a Kaypro II and a Commodore 64.) Stephanie now owns a VIC-20.

This isn't the first time Stephanie's computer experience has helped her earn money. Two summers ago, both she and her younger sister **Abigail,** now **13,** were paid by the lesson to tutor students in programming at the EPIcenter, a private computer school in Evanston, Illinois, where they were also taking classes. The job has continued year round up to the present. Stephanie's oddest memory is of when she was teaching a class and "my mom was in it! It was kind of fun; she'd raise her hand and I'd come help! It seemed weird after all these years of *her* teaching *me*!"

Abigail finds teaching "interesting, [because] you get to see everyone else have the same problems you did."

This can, in turn, help you, says Stephanie, because "it reinforces what you know. If I've forgotten something and I want to explain it to others, then I relearn it myself."



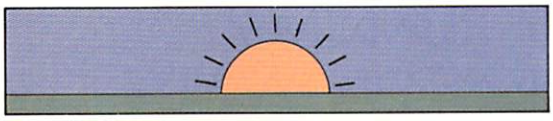
Craig Rice, 17, got his first summer computer job last year when he was asked by a teacher at his high school in Oakdale, Minnesota, to word process the upcoming school year's computer class lab problems, tests, and answer keys. The teacher chose Craig since his knowledge of computers made him more likely to catch typographical errors. Self-taught in BASIC, Craig's programming skills were established when his science program won an award from MECC (Minnesota Educational Computing Consortium), an organization that promotes computer use in school.

One job led to another. Soon Craig was asked by his school to write a basketball program (and accompanying documentation) that would keep track of game, player, and league statistics. Throughout the season he constantly updated it, for which he was paid by the hour from a special school fund.

Last October, while attending a local TRS-80 users' group meeting, Craig made contacts leading to several jobs that will keep him busy this summer. The first involves writing documentation for GamBit Multisystem, a multiuser recreational system based in St. Paul, Minnesota. The second job requires writing documentation for a new Commodore 64 communications program for which he will receive a royalty on each program sold.

Craig approaches each job by "first familiarizing myself with the complete capabilities of the system or the program through a lot of hands-on experience. Then I divide the information into logical groups. Finally, I explain each function in detailed, yet simple terms."

In between his other activities as an editor of the school paper, president of the school foreign language club, and member of the school band, Craig picks up additional pocket money word processing research reports for his father, who is a scientist.

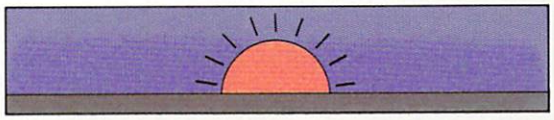


Julie Petrikas, 13, has earned money during the summer and school months working for her father, who provides computer services for the Lake Zurich Food Co-op in Lake Zurich, Illinois. To cut down on rising food costs, 36 local families have banded together to buy their food at wholesale prices. Twice a month, Julie enters the food orders into an Altos 580 computer. "My father wrote the program," says Julie, who has no programming experience herself. "He sets the program up for me. Then I copy the numbers from a sheet of paper into the computer." After the food is delivered to the co-op, it is sorted and distributed according to computer printouts.

Julie became acquainted with computers in 1977, when her father started his computer service out of their home with five IMSAI 8080 computers. (The business has since moved into a store and now includes sales.) "Since they were mainly business computers, I wasn't old enough to understand them," recalls Julie, who began using computers two years ago. "But now I'm old enough to understand them and make use of them."

Her favorite pastime is playing the game *SNAKES* (Lake Software Co.) on the family TRS-80 Model III, in between her other activities as a Little League softball player and author of three children's poems (as of yet unpublished).

DON'T DEFEAT YOURSELF BEFORE YOU BEGIN BY ASSUMING YOU ARE UNDER-QUALIFIED.



Mike Parchomenko, 17, works part-time three days a week and full-time on Saturdays at the Computerland store branch in Arlington Heights, Illinois. In the summer, he plans to work full-time. "I am in a 'distributive education' program at high school," explains Mike. "We attend school half a day, and work in a selected field the other half." Mike, a high-school senior, earns an hourly wage helping the technical staff assemble and test computers. He also earns a commission on the computers he sells. "There's three types of [customers]: people who don't know anything about computers but want to get started, people who have maybe a basic knowledge of computers and know what they're doing, and people who have worked with computers for a long time and are experts. I find the first two categories the most cooperative," says Mike, who has "to analyze what they want to use the system for, and take it from there. What you have to do, in short, is find the software first, and then the computer that runs that software."

Mike first became interested in computers at age 11, when he tried writing a "post-nuclear war" text adventure game on a friend's brother's computer. The effort failed, but his interest was piqued. He started attending programming classes in high school, soon receiving straight A's. Last December he bought an Apple IIe with his earnings from the store. Now he is helping to organize a software users' group out of a local library, and is a frequent user of statewide bulletin boards. He hopes to become a professional programmer.

Mike's interest is catching. "My mother got interested in computers after seeing me use one," he says. Now Mike's mother uses his computer to keep track of all the names she paints on the ceramic pins she handcrafts and sells at art shows. ◘

A New-Age Mom-and-Pop Business

MANY PEOPLE DREAM OF RUNNING A COMPUTER STORE. THE SERAN FAMILY TOOK THE PLUNGE.

BY NICK SULLIVAN

Foreground: Tony and Carol Seran in front of their Colorado Springs computer store. Background: "Silicon Mountain" looms above the city.

Ring my bell!

Tony Seran, a vigorous, enthusiastic man with the sharp eyes of an eagle, challenges people with that phrase whenever he's looking for an exciting piece of news. Late-breaking or underground news about a hot new computer is most likely to excite him—which is fitting, since he and his wife, Carol, own and run a computer store.

The two self-proclaimed ex-hippies, who once ran a small-town general store, think they are forging a new concept in retailing. "We're

PHOTOGRAPHS BY ROB STUEHRK

Mom-and-Pop grown up—mature and professional—with a 'technology' business that's expanding fast," says Carol.

Five years ago, the Serans came out of hibernation in a small town, rubbed their eyes, and set up the kind of small business that many people dream about. They're successful IBM dealers— a quintessential Mom-and- Pop business, 1980s style.

THE BIG SLEEP

"We woke up to the new world one day and realized we had missed 12 years of it," says Carol. "We also realized that as parents we weren't giving our children the information to deal with this world. So we moved from a rural environment with a 1940s setting into the 1980s—and started dealing with an awesome amount of technology and information."

Says Tony, "Living in an alternative society—meaning the regression from the corporate mainstream and the big cities that started with the Woodstock revolution—was an experiment for us. But with the inflation of the 1970s we felt very pressured economically. Carol and I were both running the general store, but I was also moonlighting as a 'roughneck' on oil derricks. Just to make ends meet.

"We finally said, 'Hey, we both went to college, but at the rate we're going, we're not going to be able to send our children to college.' That realization is what sparked the change. If it hadn't been a move into microcomputers, it would have been something else. Don't ask me what."

THE BIG MOVE

In 1979, the Serans sold their general store in Gardner, Colorado (elevation: 7,000 feet; population: 285), and moved 129 miles north into Colorado Springs to sell a product they knew little or nothing about. "We had to drive to a distributor in Oklahoma City to pick up our first shipment of computers," says Carol. "When we got back to the store we realized we had no disk drives or monitors. We didn't know you needed disk drives or monitors to make a computer work."

But, with Tony, 36, as an ex-Olivetti salesperson, developing and hustling up business, and with Carol, 37, setting up and handling the books, they learned fast. In the first year, they grossed five times the money they had taken in per year at the general store. Nonetheless, it was touch-and-go for a while.

Any money they made was pumped back into the business, since, by the usual standards, they hadn't started out with a tremendous investment—$36,000. Tony's mother and sister had each put in $15,000. Tony, who's an avid pilot, sold an old airplane engine, which had been smoldering in his garage, for $6,000. "We had to *pay* someone to buy the general store," says Carol.

Because of their "negative cash flow," the Serans lived in the back part of the store for almost two years with their children, Lia (18), Nicolas (16), Lupine (14), and Anthony (10). As the business grew and began to encroach upon their living space, the Serans finally moved into a regular house.

KNOCKING ON BIG BLUE'S DOOR

Academy Computers, as their store is named, is an independent, official IBM dealership, although it didn't start out that way. Landing the dealership, after a long and arduous application process, has been the key to the Serans' success. "It means security and better sleep," says Carol.

"A few years ago we were feeling heavy market pressure. It was the pressure that IBM was putting on the industry," says Tony. "I had this feeling that I was losing control, and thought about selling out." Instead, he wrote a "well-executed" business letter that elicited a response from IBM. Tony went to headquarters, and sat across a polished table from an IBM manager who somehow evaluated Tony's business acumen. Then, in preparation for a visit from Big Blue, the Serans drew up a long-term business plan. And Academy Computers underwent a facelift.

Among other things, an all-glass, soundproof "super room" was built. Now, when the store is crowded, salespeople isolate the "heavy hitters" and usher them into the super room to "talk turkey." That was designed to impress IBM—and it did. "We went first class, and turned ourselves into an organization," says Tony.

The Serans, who have been selling 10 IBMs for every Apple (the store also carries Panasonic computers), are now being encouraged by IBM to open up more Western dealerships. "First, I want to expand this store," says Tony. "I'm now selling telephone systems and office furniture, which are high-profit items. Then, I want to get this store running on automatic, with tight inventory controls, and then open up some new places. Otherwise, we're just another Mom-and-Pop operation."

BYE-BYE, ICE AGES

With 21 full-time employees, Academy Computers is a bit more than a family operation. But there are moments. Nicolas, who is being "groomed," works at Academy four hours a day on service and maintenance. And Lupine often works after school cleaning ashtrays, emptying garbage, answering phones, or helping the assistant bookkeeper—whatever her mother asks her to do.

Lupine's views on the family's monumental lifestyle change are pretty clear-cut. Fourteen-year-olds don't mince words—she "hated" living in the store. But she's glad to be in Colorado Springs. "Gardner's in the Ice Ages."

"PEOPLE WHO ARE UP ALL NIGHT TRACKING SATELLITES WITH INFRARED ARE DOWN IN OUR STORE THE NEXT AFTERNOON TEACHING MICROS."

Features editor NICK SULLIVAN *last wrote "Fishing for a Computer" for the May issue of* FAMILY COMPUTING.

Tony and Carol monitor one of the classes conducted regularly in the store.

IN THE BEGINNING

"We have no social life," says Tony, trying to mask his satisfaction. "It's just family and work. We eat, drink, and sleep computers. Between Carol, myself, Nicolas, and Lupine, we work 150 hours a week. I love it."

The whole thing started in 1979, when Tony's sister unexpectedly sent the Serans an Apple computer for Christmas. The idea, which came from a friend of hers, was to get the kids interested in computers. It got Tony more interested. He flew to New York to visit his sister's friend, the "idea man," whom Tony cryptically refers to as "Bob D." They stayed up all night talking about computers with the enthrallment of two young boys building a city with an Erector set.

Bob D., a successful financier who cofounded a New York investment firm, convinced Tony that the time was ripe to open a computer store. Ever since that hot tip, Tony has looked to Bob D. for advice: when to expand, how much to reinvest, and what products to stock. It was Bob D. who told Tony he wouldn't stay in business long without IBM products on the shelf.

Bob D., who has been involved in the high-tech market for 16 years, is Tony Seran's guru.

SERVICE WITH A SMILE

From the start, one of Academy Computers' operating principles was that it would be a full-service computer store. Part of this notion was a carryover from the folksy, coffee-and-doughnuts atmosphere the Serans had created at the general store. But more of it came from a perceived need to establish an identity. As marketing people would say, "positioning."

"We service anyone, even people who haven't bought anything from us," says Tony, who will run across the office to answer a ringing phone, thinking it might be a customer in distress. "We're market-driven, not product-driven. We're selling the store and ourselves—not products—because you never know what's going to happen with certain products."

Service is the main theme of Academy's TV commercials, which star Tony standing next to a pile of unmarked boxes saying, "At most computer stores this is what you get." At Academy, of course, you get more than just a box and a sales receipt. A nice idea, but not so easy to execute.

WORDSTAR IN THE AFTERNOON

Now here's some luck. A man named Fred Lloyd just walked into the store one day in 1980. He was carrying an ohmmeter — and looked like a real, live computer technician. He was also looking for a job. Fred, by a roundabout way, had come from Florida, where he wrote programs and serviced computer equipment that helped run a touring carnival show. "I looked him in the eye and asked him if he was an expert. He said 'Yes,' " says Tony. "I liked the way he said 'Yes' without flinching, and told him to start working."

Fred, who had just spent his last $500 on a circuit board that he transformed into a working computer and sold for $1,500, has been technical director at Academy ever since. He and Tony have their own local radio show, "Random Access," which airs every Saturday morning.

To further bolster its service claim, Academy sponsors summer camps, called Computer Treks, in conjunction with the city's Parks and Recreation Department. And it offers ongoing classes in computer instruction that run both afternoons and evenings. Students who've bought a computer at Academy get a 50 percent tuition discount. "The classes are a great promotional tool," says Tony. "You can be walking down the street and look in our store window and see the guy who sold you your house, or your doctor, pecking away at a computer."

SILICON MOUNTAIN

The greatest product in the world won't sell in the wrong market. Colorado Springs happens to be a great market for computers. There are 23 thriving computer stores in a city of 250,000—a relatively high per capita ratio. Why?

NORAD (North American Air Defense Command), the top-security government installation which was featured in the movie *Close Encounters Of The Third Kind*, is nestled in the mountain that rises behind the city. Because of NORAD, the Air Force Academy, Fort Carson and several other military bases, and a

STARTING A COMPUTER STORE: TIPS FROM THE SERANS

1. Capital. "If you want to do it right, you need $250,000 to start. We started with $36,000, but today that's not enough to make the big companies talk to you. They'll walk out the door. And you can't grow and expand without the big companies on your side. All you can do is survive."

2. Instinct. "Search your soul deeply to confirm to yourself that you're a retailer. It takes a tremendous amount of time. As a family, we spend 150 hours a week working. And that doesn't count the time we spend studying. If you're not a born retailer, this time commitment will wear you down."

3. Adaptability. "Be aware that selling computers is a very dynamic occupation. You have to change your thinking—and often your business plan—daily. Ask yourself if you're willing or able to continually adapt—or whether you're actually looking for a nice, steady business."

4. Location. "Location is key. Avoid the strips and the malls. Go downtown. That's where businesspeople are, and the main computer sales market now is business."

5. Identity. "You've got to define what you're going to be—a Mom-and-Pop outfit, a big discounter, a service-oriented business, or whatever. We chose to focus on service. The point is, you've got to choose some position. You can't go into the void and exist by just relying on a long line of products. You don't want to stake your business on products or companies whose life span or support for you is up in the air."

6. Product Choice. "You certainly don't want to have to actively sell products. You can't establish an identity of your own if you're spending all your time selling computers. You want products that sell themselves, so that you can focus on other things. Some stores advertise a long list of products, which is crazy. No one comes in and asks for obscure brands—they have to be sold, and that takes energy. Choose products that are going to give you the highest profit with the least effort. In short, aim to market your store and yourself even more than the products you stock."

7. Commitment. "If you're going to sell computers, do it because you like retailing and want to be in it for the long haul. If you try to sneak in the window of opportunity to make the quick buck, you're probably going to lose money. To make money in the short term, you're going to have to be either lucky or unethical."

8. Human Factor. "Start-up capital is obviously important to success, but in the end money and/or the clothes you wear don't have a lot to do with success. You've got to make people comfortable. That's very important. To do so, *you've* got to be comfortable. You can't be uptight. People respond to people. We still have dinner every year with our first customer on the anniversary of the sale."

"IF YOU TRY TO SNEAK IN THE WINDOW OF OPPORTUNITY TO MAKE THE QUICK BUCK, YOU'RE PROBABLY GOING TO LOSE MONEY."

host of computer-oriented companies such as Honeywell, Hewlett-Packard, and ROLM, the NORAD mountain has been dubbed "Silicon Mountain."

Not only does this mean there are a lot of computer professionals around town, many of whom are steady customers at Academy, but it gives the Serans a wealth of resources to call upon. Says Rob Ross, Academy's general manager, "A lot of people who are up all night tracking satellites with infrared at NORAD, are down in our store the next afternoon teaching micros."

MEGATRENDS

Native retail instinct aside, seeing what's happening to the Seran family gives an inkling as to how microcomputers are dramatically changing life in America.

Imagine pin-striped IBM, the world's largest computer manufacturer, courting a dealer who: 1) went to the 1969 Woodstock rock festival; 2) jumped in a car on the East Coast and headed aimlessly towards San Francisco, much like his future wife, who was "galavanting around California in buses and trucks with 37 other people"; 3) "dropped out" to run a general store with her in a tiny Colorado mountain village.

That cheerful and carefree side of the Serans—what Tony calls "open architecture"—hasn't diminished. But it's been incorporated into their new business lifestyle. Carol's comfortable with accounts payable and tight inventory control, but even more comfortable in old blue jeans and tousled hair. "I've got to be careful how I look on the streets, because people know me and I don't want to embarrass the business. I've got to wear new blue jeans."

Tony's back in the white shirts and ties he used to wear as a teenager, when he was assistant to the president of a New York City shoe store. But he still loves madcap trips through the West—like speeding along Utah's open highways in the middle of the night, or landing his Beechcraft Bonanza plane in a Las Vegas backyard to catch computer trade shows.

Ring my bell! FC

Five-Year-Old Authors

PHOTOGRAPHS: IBM

DR. JOHN HENRY MARTIN HAS KINDERGARTNERS READING AND WRITING AS IF THEY WERE BORN KNOWING HOW

BY BETH POWELL

Writing to Read kindergartners learning to recognize the word "dog" (above).

An average five-year-old knows 2,000 to 4,000 words and can use them in conversation. But it will be years before he or she will read and write at that level. Can we teach reading and writing more effectively? Can the computer help?

Both questions get a resounding "Yes" from Dr. John Henry Martin. Over the last 30 years, Martin has supervised everything from a one-room schoolhouse to a major suburban school district. He's chaired a federal education task force and lectured at Harvard.

Martin spent many of these years observing the tedious, painstaking way schools teach children to read and write. He decided he had some better ideas, and with IBM grant money, he developed the Writing to Read System. During the 1982-83 school year, 100 kindergarten and first-grade classrooms throughout America tested Martin's program. Thus far, the results—at least as far as shown by standardized tests—have been remarkable.

CAT AND MOUSE

Six-year-old Angela Brown is sitting in front of an IBM PC in one of those classrooms, a computer room at Palm City Elementary School in Martin County, Florida.

She starts typing. A mouse jumps across the screen in front of her. Not fast enough, though: A cat catches it.

"Hooray," she yells. "We get to play again."

The game requires her to type MOUSE fast enough to trigger a graphic mouse to run into his hole before his feline foe catches him. It's fun, unlike some reading textbooks.

In Writing to Read, the computer introduces new words by displaying them on the screen and pronouncing them through a special voice generator. It then asks each child to

Freelancer BETH POWELL *of Jacksonville, Florida, wrote the article for Home-School Connection that appeared in the April issue.*

repeat the word and spell it aloud. Finally, it asks the children to take turns typing the appropriate letters on the keyboard.

In pairs, students will be asked to clap their hands, stamp their feet, and chant the new letters and word.

If the computer is given a wrong answer, it simply repeats the question. At the end of each three-word cycle, children are asked again to spell the words they've learned. If a child makes two errors, the computer repeats the words.

Martin supplements the straightforward instruction with a healthy dose of fun, such as the "cat and mouse" game Angela was playing.

A "silly sentences" program starts children learning sentence construction by asking them to copy sentences such as DID YOU EVER SEE A PIG IN A BED? A graphic of a pig accompanies the question.

The computer is only part of Writing to Read. After no more than 15 minutes apiece at the IBMs, students move on to other workstations, to reinforce what they've learned.

First, they write out the new letters and words in work journals as they listen to taped instructions. Then, they point to the words in books of classic stories such as "The Emperor's New Clothes" as they hear them read aloud.

Finally, students move to typewriters to write the words they've learned, combine them into sentences, and eventually into stories.

READING BY WRITING

Palm City Writing to Read teacher Joann Higden says, "Normally, a kindergartner never attempts to write, but here the children are told they can write a story—and they do—and what's more, it's obviously fun for them."

Here is part of a story written by a first grader after six months in Martin's program:

"One day I took a trip to outer spās. On the way I saw a Marshon so I landed on Mars to see the Marshon and I made friends with him. He told me all about spās and we had lots of fun together."

The phonemes—such as spās for 'space'—are there, sprinkled in with standard English. They worry some parents. At first, Higden says, "parents would say, 'I can't read this. You're teaching my child to do things wrong.' "

But Writing to Read consultant Dr. Leonard Tomasello, principal of West School in New Canaan, Connecticut, says program graduates quickly learn to comprehend conventional spelling and, though it sometimes takes time, start using it themselves.

Higden agrees, saying that first-grade teachers who had Writing to Read kids after they were in the program found no problems. *(See accompanying article, "The Phonetics Controversy," for educators' views on phonetics.)*

COMPUTERS OR PENCILS?

Martin was fascinated by Depression era research showing that young children learned better in all subjects after they were taught to type. When Writing to Read was conceived, he planned to use electric typewriters, not computers. Now, he uses both.

Typing makes it easier for children to physically express what they're thinking, Martin says. Small fingers can touch an electric typewriter key much more easily than form a letter with an oversized, hard-to-handle pencil.

THE PHONETICS CONTROVERSY

"Won dā I met a boi and ā gerl. Thā were in luv. Thā gāve toiz and thā gāve flouerz too."

Those strange phonetic marks and spellings sprinkled in with conventional English in the writing of Martin's schoolchildren may be the most controversial aspect of Writing to Read. Educators have long debated the value of phonetics in teaching reading.

Phonetics advocates like Martin believe that a major reason some children who speak beautifully can't read or write is the bewildering inconsistency of the English language.

In Martin's words: "We put an 'r' in front of 'ough' and say it's 'rough.' We take the 'r' off and put a 't' at the end and say it's 'ought.' We put a 'th' in front of it and say it's 'though.' We put in an 'r' and call it 'through.' "

Writing to Read teaches children a way to write the 40-or-so sounds that make up spoken English. Once children can write, he says, they're better able to discover and cope with spelling inconsistencies. Or, as many Writing to Read graduates put it, "I can write anything I can say."

Other educators do not share Martin's view. According to Dr. Shirley Feldmann, a reading researcher at the City University of New York, phonetics were stressed more in the 1960s than now.

Feldmann says many educators now believe we learn to read through context and experience. That is to say, children learn new words by understanding the words that surround them, and combining that knowledge with what they already know about language and the world.

If this psycholinguistic approach is right, the best way to prepare young children for reading is to expose them to lots of language first, especially by reading to them. "Every child will figure out his or her own rules" for dealing with the language, Feldmann says. The teacher should act as a guide, helping the child to develop these rules, and steering him or her away from serious mistakes.

These educators say phonetics aren't very important in this process, and if you spend a lot of time teaching them, you may well neglect the other skills children need to figure out language from context.

Feldmann takes a middle view. She says that while some kids will be puzzled by learning phonetics first, others "will need to look at the phonetic details."

In any case, some educators who oppose Martin's use of phonetics do like other things about his program, which uses a number of strategies to supplement phonetics—including some good old-fashioned classic books.

—BILL CAMARDA

When microcomputers came along, Martin quickly realized their potential. "A computer with voice capability combines the typewriter, motion picture camera, radio, and tape recorder all into one instrument," he said. "But the computer does even more. It reacts to a child, and if programmed with sophistication, will respond and change what it does based on a child's actions."

Martin County administrators and teachers involved in the program think the Writing to Read kids pay more attention to what they're doing. School Superintendent V. James Navitsky says, "Kids are very intense in their activity time with the computer. You walk into a classroom where children are working on computers, and they don't even notice you."

REMARKABLE TEST RESULTS

Nationwide, children taking the standardized California Achievement Test reading exam after participating in Martin's program score

Children are guided by the friendly, digitized voice of Martin's own daughter.

on average between the 85th and 90th percentile—far above normal.

This is even more remarkable considering that about one-third of Martin's students are poor and minority children who tend, on the average, to score lower on standardized exams.

The Martin County children who took the first experimental Writing to Read courses six years ago using only typewriters, are still outstripping their peers on reading and writing exams, says Superintendent Navitsky.

"Last year, our Writing to Read fifth graders were ranking consistently in the 76th percentile, while somewhere around the 50th is the norm for us," he says.

Palm City teachers say the program works with below average, average, and gifted students alike. They say it builds students' confidence in their ability to communicate. First-grade teacher Lynette Walker says, "Before, it was an ordeal getting my kids to express themselves. Now there's no hesitation. We talk about writing, and they sit down and write. Where I ask for one sentence, they're writing three."

"I'm finding more involved statements," adds first-grade teacher Jan Reed. "My students are not just saying 'I like this' or 'I like that' anymore. My kids also have more knowledge of vowels and consonants than last year."

Parents—and siblings—have noticed the changes. Third grader Jason Wall's parents say he's become more interested in reading and writing by watching his younger sister, Jenny, who's a Writing to Read graduate.

"Jenny's imagination is tremendous as far as writing stories goes," Mary Wall says. "We're amazed. We're always sending stories to grandparents."

THE FUTURE

IBM will probably begin selling Writing to Read widely in time for schools to use it at some point during the next school year. (*See accompanying article, "Writing the Check."*) Should that happen, thousands of electronic mice will be running from thousands of electronic cats. And thousands of American five-year-olds may become better writers and readers. FC

WRITING THE CHECK

Barring major surprises, IBM will be selling Writing to Read in time for schools to use it during the next school year.

IBM has not yet formally priced the program, but it has already offered it to some schools on a test basis at $4,000–$6,000 per system—the equivalent of up to $50 per student over five years. That includes all software, manuals, and materials. But it doesn't include IBM computers, peripherals, and typewriters, which are sold separately at a special price. IBM Manager of Education Special Programs Rodney Roberts said Writing to Read may well be sold in connection with the IBM PC*jr*, rather than the more expensive PC.

Even so, Writing to Read may be costly, at least in comparison to what most schools are doing now. According to Bobby Goodson, computer resource teacher in California's Cupertino Union School District and past president of Computer-Using Educators, districts are likely to evaluate the program very, very carefully before making the investment. "If all the hardware were already in place, it might be different," she said, noting that IBM computers are in relatively few schools, and are often in high schools, not elementary schools. "This is not a time when schools can easily buy into anything so major."

IBM's Roberts said the company worries about the price issue and will try to price Writing to Read within the reach of most schools. He adds that by the time they buy readers and workbooks, most schools have already spent $30 per student.

Price is an especially sensitive issue because early indications are that Writing to Read has the potential to be a remarkably effective tool in closing the normally huge gap in reading test scores between middle-class and poor children. If poor children are to benefit from it, poorer schools will have to be able to afford it. —B.C.

BUYER'S GUIDE TO COMPUTERS

A LOOK AT THE LEADING BRANDS FOR FAMILY USE

Walk into any computer store and ask a salesperson what computer to buy. You're likely to get one of two stock answers: "How much do you want to spend?" or, "What do you want to use it for?"

If you get the first question, run—don't walk—to the nearest exit. No matter what the price, a computer is useless to you if it won't do what you want. And a salesperson is useless to you if he or she is primarily interested in selling you the most expensive system you can possibly afford.

If you get the second question, think it over . . . carefully. How you answer will go a long way toward defining your computer needs.

Briefly, here's what you can do with a computer: 1) manipulate text (word processing) and numbers (spreadsheets and other financial software); 2) communicate with other people and institutions that have computers (if you buy a modem); 3) store and manipulate information (with a data base program); 4) learn things (with educational software); 5) play games; 6) draw pictures and make music; 7) improve your well-being (with health and fitness software).

Not every computer does all those things equally well. An ideal computer for word processing may be totally inadequate to play sophisticated computer games. And no matter how well a computer is designed, it won't do what you want without software. Each home and personal computer has its own software strengths and weaknesses.

PLANNING A BUYING DECISION

There are a number of sources for the information you will need to make an intelligent buying decision, beginning with this Buyer's Guide. Here's a list of steps to get you started.

1. Once you've defined your primary needs and figured out which computers can run the software you'll need, look for people who already own the computers you're considering. Your children may have friends with the same machine. Another approach is to contact a users' group—a club that exchanges information about one specific computer brand or model. Most of the computers discussed here have scores of users' groups across the country; you can reach the nearest one through your computer store, or by calling the computer's manufacturer.

2. Ideally, you should find a store that has the type of software you're looking for, computers to demonstrate it on, and staff that can help. This is not always easy to do, and if you're in the market for a very inexpensive machine, it may be impossible. But it's worth a try.

Check the "documentation"—the instructions—for both the software and hardware. Will you be able to understand it? Though computers and software are getting easier to understand and use, they can still be pretty confusing. Then just play with the computer and experiment. (You can't break it!)

3. Do a little daydreaming. If you want educational software for your children, but also think you might like to set up a small word-processing or accounting business at home, your ideal computer would handle both well. If such a computer is more than you can afford, so be it. At least you now have a standard for comparison—and you can begin to make the choices that accompany any buying decision.

4. Don't compromise away anything that's essential to you. If you really need professional word processing, don't buy a computer that's barely adequate for typing letters—even if it has all those neat educational games your infant may need someday. (You may even decide that it makes sense to buy an inexpensive "starter" computer for your children, and a more sophisticated one for yourself. That can actually prove cheaper in the long run.)

5. Consider the stability of a computer manufacturer in making your decision. You will want long-term support and service. "Fishing for a Computer," in FAMILY COMPUTING's May 1984 issue, isolated major market trends and gave short profiles of the major manufacturers in the home market.

6. Finally, you don't have to approach computers with the same seriousness as a Fortune 500 company would. Home computers should be fun as well as productive. They can be the keys to your imagination. In choosing a computer, trust your instinct and intuition as much as the "nuts-and-bolts" factors. You can't have much fun with a machine that you talked yourself into—one that you think is "good for you."

GUIDE TO THE CHART

This Buyer's Guide examines six best-selling computer brands that are commonly bought for home use: Apple, Atari, Coleco, Commodore, IBM, and Radio Shack. Strictly business-oriented and portable computers are not considered here. Portable computers will be covered in the July Buyer's Guide.

Here are explanations of the factors included in the accompanying computer comparison chart.

Suggested Retail Price. These are the manufacturers' official prices, but computers are quite often sold for less. Sometimes the basic computer—often a keyboard unit—is discounted, and peripherals such as disk drives, monitors, modems, and printers, are sold at or near list price. General price ranges for these devices are: disk drives, $250–$400; monitors, $80–$600; modems, $80–$500; printers, $150–$1000. More and more frequently,

retailers are selling the computer as part of a complete system—with disk drive, monitor or printer, and sometimes even software.

RAM. Random Access Memory (RAM) can be compared to a scratchpad: it's the space you and your program have to work with. The amount of RAM your computer has will affect the kind of software it can run. (RAM is measured in "K"s, or kilobytes, with one K equal to 1,024 characters—roughly a double-spaced, typed page.) Word-processing programs generally require at least 48K to be used effectively; business software, such as spreadsheet programs, usually require at least 64K. Memory requirements for games and educational programs vary widely, depending on their sophistication.

Note: If you're programming in BASIC, or working with a disk drive, the computer will use some of its RAM to keep these functions running smoothly, leaving less for you.

ROM. Read Only Memory (ROM) is built into the computer by the manufacturer, and its contents cannot be changed by the user. The BASIC programming language that is built into many microcomputers is usually contained in ROM, as is the computer's operating system—the instructions that tell it how to work. Microcomputers with larger amounts of ROM tend to have faster, more sophisticated functions built in.

Keyboard. A keyboard with "full-travel" keys, which look and feel like typewriter keys, is important for any application that requires extensive typing, such as word processing or programming. Less professional keyboards—those with rubber, nonsculpted, or cramped keys—are best suited for use by smaller children, or for game playing. A "numeric keypad" is a valuable feature for those who handle numbers extensively; if it is not included, it is often available as an option. Added function keys are sometimes used by software producers to simplify their programs.

Text Display. The ideal screen display for word processing text is 80 characters across (called 80-column) and 24 lines down. Some computers come with this; others offer 40-characters across, or less. For the casual user, this is probably enough. Sometimes, the screen display can be upgraded with an 80-column adapter, but make sure that the software you want will run properly with such an adapter. Most computers that display more than 40 characters across will look much better with a monitor; on a TV, the characters will be blurry.

Color, Resolution, and Graphics Modes. Most computers designed for home use, and many business machines, come with some kind of high-resolution color graphics. Consider the number of colors available, as well as the screen resolution. This is measured in pixels (picture elements), horizontally and vertically. The more pixels, the sharper the screen image.

Some computers offer several graphics modes, letting you trade off colors in exchange for resolution. A computer might have a very high resolution mode with four colors, and a much lower resolution mode with 16 colors. Finally, "sprites," featured on some computers, allow the user to create and move objects on the screen to create animated effects.

Sound. Microcomputers generally offer from one to four "voices," or channels of sound. These voices may cover varying octave ranges. Some computers come with special chips that allow for more sophisticated handling of sound. Others can produce anything resembling music only through Herculean programming efforts. The extent and quality of sound output is most important for game playing, or for those who wish to experiment with musical composition.

Interfaces. Some computers come with standard serial and/or parallel interfaces that easily allow you to hook up peripherals. (Printers require either a serial or a parallel interface; modems use a serial interface.) Other manufacturers sell computers with unusual interfaces, which limit you to using their peripherals unless you buy an add-on interface. Some manufacturers include no interfaces at all, requiring you to buy them separately. For more on interfaces, see "Making Connections" in FAMILY COMPUTING's April 1984 issue.

APPLE IIe

The Apple IIe is the third model in the Apple II line, which was introduced in 1977. (The fourth model is the newly introduced Apple IIc, which is previewed in this issue.) More software is available for the Apple II series than for any other microcomputer, both because it's been around so long, and because Apple made public everything anyone needed to know to write software for it.

Though Apple has always encouraged use of the IIe as a business computer, it's a true general-purpose machine, with a wide range of every type of software. There is also a wide variety of add-on hardware for the Apple, including a circuit board that lets it run standard CP/M business software, and a dual disk-drive unit ($1,500 from Rana Systems) that allows the Apple to run much of the IBM PC software.

The keyboard is standard typewriterstyle, with a firm, responsive touch. The IIe comes with 64K RAM, which can be expanded to 128K; many stores are already selling it

10 LEADING COMPUTER MODELS FOR HOME USE

Computer	Price*	Standard Maximum RAM	ROM	Keyboard/ # Keys	# Colors	# Voices/ # Octaves	Standard Text Display	Sprites	Disk Drive Storage	Maximum High Resolution	Built-in Serial Interface
ADAM	$750	80/144[1]	N/A	F/75	16	3/5[1]	36×24	32[1]	256K	256×192	—
Apple IIe	$1,295	64/128	16	F/63	16	1[2]	40×24	N	140K	560×192[3]	—
Atari 600XL	$249	16/64	24	F/62	256	4/3.5	40×24	8	127K	320×192	—
Atari 800XL	$399	64/64	24	F/62	256	4/3.5	40×24	8	127K	320×192	—
VIC-20	$99	5/32	20	F/66	16	3/5	22×23	N	170K	176×184	Y
Commodore 64	$199	64/64	20	F/66	16	3/9	40×25	8	170K	320×200	Y
IBM PC	$1,749	64/640	40	F/83	16	1/4	80×25	N	360K	640×200	Y
IBM PCjr	$669	64/128	64	C/62	16	3/N/A	40×24	N	360K	640×200[3]	Y
TRS-80 Color 2	$159	16/64	8	F/52	8	1[2]	32×16	N	156K	256×192	Y
TRS-80 Model 4	$999	16/128	14	F/65	B/W	1[2]	64×16	N	368K	640×240[3]	Y

FOOTNOTES

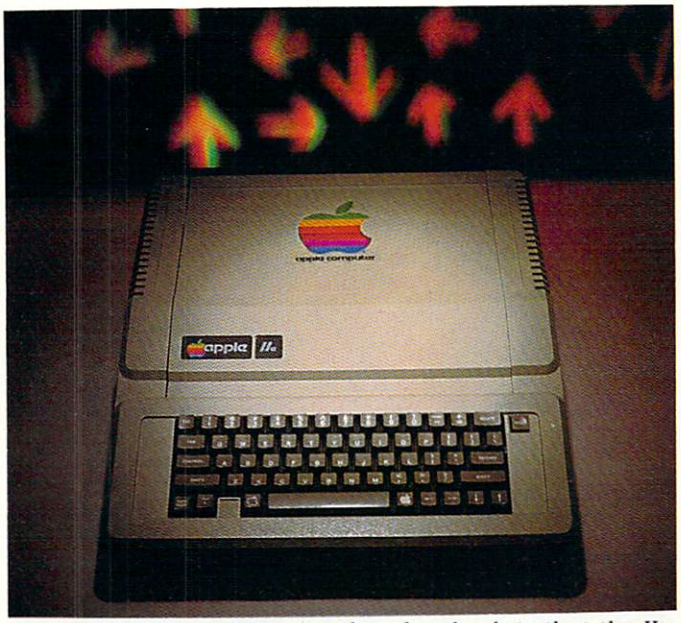
1. *Not yet available*
2. *One-voice computers can be programmed to output varying numbers of tones.*
3. *This high resolution is available on the Apple IIe with an Extended 80-column card; on the PCjr, with 128K and Cartridge BASIC; on the TRS-80 Model 4 with a hi-res graphics board.*

KEY TO CHART

F = *Full typewriterstyle keys*
C = *Rubber, "Chiclet"-style keys*
***** = *Subject to market fluctuations*

with 128K. The IIe's screen display is 40 characters across, but this, too, is commonly expanded to 80 columns. The Apple's expandability is no coincidence: It comes with eight expansion slots that can be used to improve the internal workings of the machine. For this reason, Apple expects to keep selling the IIe—despite the introduction of the new IIc—to serious "hackers" who want to configure the computer to their own needs.

This "open architecture," however, is one of the main drawbacks of the IIe for many users. Parallel and serial interfaces aren't included. To add a printer or modem, therefore, you must buy one or two interface cards, which cost from $150 to $200. This means that an Apple IIe system costs substantially more than a comparable Atari 800XL or Commodore 64 system, though not more than a



comparable PC*jr* system. Another drawback is that the IIe has limited sound (one primitive sound channel) and color capability. This can somewhat lessen the impact of entertainment software.

Nonetheless, the Apple IIe is an extremely flexible computer, good for virtually any task. It's a reliable workhorse that rarely requires repairs. It's not state-of-the-art technology, but because so many third-party manufacturers support it with innovative products, the machine will grow with your needs.

ATARI 800XL

The 800XL, an enhanced and sportier version of the Atari 800, is a fine general-purpose machine. Though its large software library (over 2,000 programs) is game-heavy, there is plenty of productivity software available—including *VisiCalc*, the well-known spreadsheet program, and *Letter Perfect*, a fine word-processing program.

This 64K machine's highlights are its superb graphics and sound capabilities, which can make game-playing and/or programming a real joy. The 800XL can display 16 colors or 128 "hues" (chosen from a palette of 256 hues) at any one time. Its eight "player missiles," which are the same as sprites, allow programmers to create good animated effects. These, of course, have been put to good use in video games. Unfortunately, Atari has provided very little instruction on BASIC programming along with its computer, suggesting instead that you go out and buy a book from someone else.

The keyboard is easy to use, with five special function keys along its right side that can simplify program operation. The keys are large and well-spaced, though not fully sculpted. The keyboard has 29 graphics keys. For those studying foreign languages, a special international character set is available.

Atari offers a disk drive ($415), but those sold by third-party manufacturers are probably a better value. The Atari disk drive has limited storage capacity (127K). Drives from Indus, Rana, and Trak receive kudos from Atari fans. If you want a cassette recorder rather than a disk drive, you'll have to buy Atari's. The Atari Touch Tablet ($89), which allows the user to draw pictures, is a superb device.

The Atari 1030 modem ($139) is also a very good deal, as is the 1027 letter-quality printer ($349). Connecting most non-Atari printers to the 800XL requires an interface unit. Two exceptions are printers from Axiom and Star Micronics, which sell cables with their printers that will connect directly to the computer. (The Trak disk drive has a parallel printer attachment built in.)

ATARI 600XL

For about $100 less than the 800XL, Atari sells the 600XL. It comes with 16K and can be hooked only to a TV set, not a monitor. Atari sells a "word-processing" package that includes the 600XL, the 1027 letter-quality printer, and the reasonably powerful *AtariWriter* word-processing program ($760). Since *AtariWriter* is a cartridge, it leaves all of the 600XL's 16K memory free for the user, and that's enough for much home word processing. However, the maximum screen display is only 40 characters across. The 600XL, which is virtually identical to the 800XL in appearance and has the same sound and graphics capability, can be turned into an 800XL with a memory expansion module.

COLECO ADAM

ADAM comes with built-in word processing, two joysticks, a letter-quality printer, and a fast tape drive for storage, all for under $750. That makes it a system with enormous promise. But, so far, the promise has yet to be fulfilled.

The first problem is the tape storage device, called a "digital data drive," which resembles a cassette deck but is almost as fast as a disk drive. It's a totally new storage format. Thus far, except for the ColecoVision cartridge games, which run on the ADAM, very little software is available. Second, some users have complained of minor, but annoying, problems—such as "glitches" in the screen

display, and occasional printer failures.

The keyboard is perhaps the strongest component of this 80K computer system. Key spacing and action are professional. There are 10 command keys (PRINT, STORE, etc.) that work with the built-in *SmartWRITER* word processor, and six function keys.

The screen image—when it's working properly—is good, but not exceptional. *SmartWRITER*, which displays 36 characters on a line, is adequate for most household use. Coleco promises an 80-column converter but, as with any 80-column display, it'll look better with a monitor. When attached to a monitor, the ADAM needs a special cable to output sound.

The printer is of flimsy construction, and extremely noisy. It houses the power supply, so if it breaks, you can't use the computer at all. It may be a consolation to note that Coleco now offers a 6-month warranty on ADAM, twice the industry standard.

While there is little software available, ADAM's SmartBASIC is closely compatible with Applesoft BASIC. This means that a wealth of program listings have been published. SmartBASIC is not built in; you have to load a digital tape. Once SmartBASIC is loaded, only 26K of ADAM's 80K memory is left for you to use.

Coleco says it will market a disk drive, a 64K memory expander, a 300-baud modem, and a digital data drive, as well as develop a wide range of software. But when these products will be available and how much they will cost is unclear at this writing.

If you already own ColecoVision, you can expand it into an ADAM with a $500 expansion module.

At present, the ADAM is best considered as a very reasonably priced word-processing system that offers many excellent video games and can be used for programming. Not until more software and hardware are released will the power of ADAM be realized.

COMMODORE 64

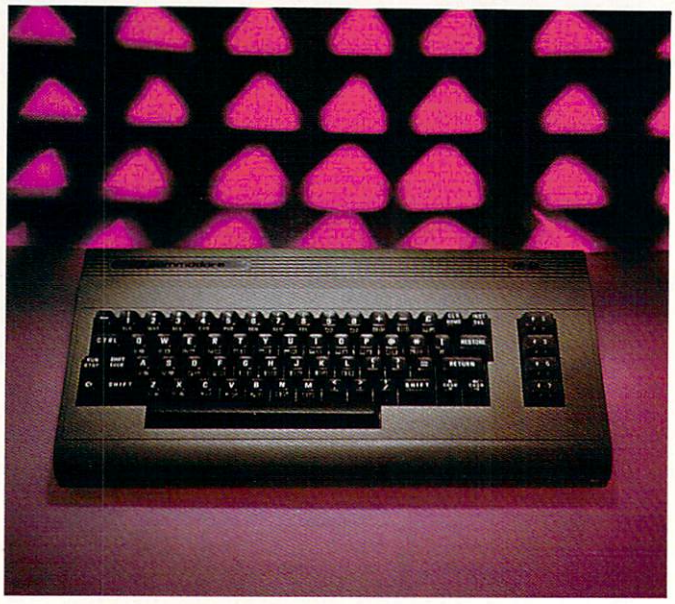
The Commodore 64, a 64K computer with some powerful features, is now the undisputed leader of the "low-end" computer market. It's hard to believe that just a year ago there was almost no software for it; now, there are over 1,000 programs on the market, well distributed in every application category. Even *Multiplan*, the hot-selling and powerful spreadsheet, is available for the 64.

The 64's attractions include superb sound and graphics. Its 16 colors and eight sprites give programmers wonderful graphics tools. The 64's sound is the most advanced of any home computer. The machine can be transformed into a sophisticated musical instrument, giving the user complete control over every aspect of sound. Some very powerful music software has been developed, most notably *MusiCalc*.

The 64 has a 40-character screen display. Add-on devices will expand this to 80 characters, but much software won't work with the 80-column cards on the market. The video display is good, but not great.

Now for the drawbacks. The keyboard has sculpted keys, but a "mushy" feel. The Commodore 1541 disk drive is somewhat unreliable and extremely slow. Programs can take what seems an eternity to load; although recently, third-party disk drives have been introduced. In the past, Commodore computers and peripherals reportedly were afflicted by high defect rates.

As for printers, if you want to use one not made by Commodore, you'll need a special interface, and it might not work with all Commodore software. Nor will it print out Commodore graphics. Finally, programming on the 64 is more difficult than on some other computers, and the manuals that come with the computer, while reasonably complete, are amongst the foggiest in the industry.



But the 64's strengths easily outweigh its limitations. Available for about $200 in many locations, the 64's power and advantages still make it an excellent buy. The computer has a lot of satisfied owners.

COMMODORE VIC-20

Now that Timex and Texas Instruments have left the home computer market, the VIC-20 stands as the only under-$100 computer worth considering for kids or casual adult users. The VIC-20 offers good flexibility and power for the price, and it can be expanded with a full line of peripherals.

The full-size, typewriterstyle keyboard is identical to that of the Commodore 64. It features four programmable function keys. The VIC's screen display is clear, but its 22-character line is extremely short, and not very well suited for word-processing. Letters have a stretched out look that can make large blocks of text hard to read.

The VIC's 5K memory may be expanded to 32K. Commodore also sells cartridges that offer special enhancements. The Super Expander, for example, provides memory specifically for high-resolution graphics. And, with eight colors and three sound channels, a crafty programmer can

create some very nice effects.

If you don't want to buy a disk drive, you'll have to use Commodore's Datassette tape recorder ($69.95). It operates primarily under computer control, minimizing the usual cassette recorder play-and-rewind hassles. Both the Commodore 1541 disk drive ($399) and dot-matrix printer ($395) work with the VIC.

Games and educational software stand out in the VIC-20 library, though some home-management software is available. However, very little new software is being developed for the VIC-20, and some software distributors no longer handle VIC-20 products. Commodore hasn't exactly phased it out; but neither is it heavily promoting the computer. Serious users will have to look elsewhere, but the VIC-20 still has great appeal for the budget-conscious buyer, novice home user, or young student.

IBM PC

Powerful and expensive, the IBM PC runs some of the most sophisticated software around, from games to full-scale business applications. The PC was not designed for the home market, but people have been buying it for the home anyway.

The keyboard has a professional feel, much like that of an electronic typewriter, but touch-typists may find the placement of RETURN and SHIFT keys somewhat idiosynchratic. The basic PC comes with 64K RAM, and can be expanded to 640K. With the monochrome display and printer adapter ($335) installed, the PC's text display is 80 characters by 25 lines. With the IBM Color Graphics Adapter ($244) installed, 16 colors are available. IBM's BASIC provides a range of graphics commands, though fewer than Cartridge BASIC on the PC*jr*.

Largely because of the IBM name, the PC has become an industry standard. As such, third-party developers are constantly bringing out new software and add-ons for the PC. However, it is considerably more expensive than many other computers that accomplish the same tasks. It makes sense for family use only if it will be used extensively for full-scale business applications.

IBM PC*jr*

The IBM PC*jr* is offered in two models: 1) a 64K entry model with two cartridge slots ($669); and 2) a 128K model with a built-in disk drive (360K storage) and an 80-column, very high-resolution screen display ($1,269).

The enhanced model, which most IBM dealers sell, is quite powerful. Much of the software developed for the spectacularly successful IBM PC computer will run on it,

as long as it requires no more than 128K memory and one disk drive. And many new educational and game programs are becoming available for it.

But there is very little software out for the entry model, aside from a few cartridge games. And some of the software that is ready—such as word processors *Bank Street Writer* and *Homeword*, requires a disk drive ($480). In short, to make full use of the PC*jr*, you virtually need the enhanced model. You can upgrade from entry to enhanced model at any time.

The PC*jr*'s keyboard (the same on both models) is both innovative and backward. Because the keyboard sends an infrared signal to the system unit, you can control the computer from a distance—much as you control a TV with a remote control channel-changer. On the other hand, the rectangular-shaped, rubber keys are not well suited for adult hands, and practically useless to touch-typists.

The screen display on the enhanced model is extremely clear and sharp. Up to 16 colors are available, though only four can be used at a time in the high-resolution mode. Cartridge BASIC ($75), an extremely powerful version of

the built-in BASIC, is necessary for the maximum resolution. You can switch between a 40- and 80-character text display on the enhanced model; only 40 characters are available on the entry model.

The number of colors, graphics commands in BASIC, and sound are all improvements over the IBM PC.

The PC*jr* has an excellent manual, and when you first turn on the computer, you can participate in a cute interactive tutorial that may dispel extreme computerphobia. On the more technical side, the computer's microprocessor—which does the actual computing—is faster and more efficient than that of any other computer discussed here.

IBM sells an internal modem ($199) that fits inside the system unit, and a thermal printer ($175). To use a printer with a parallel interface, you need the parallel printer attachment ($99).

Largely because of the PC*jr*'s inadequate keyboard, the computer seems best suited for young children. (Analysts think that IBM will eventually sell an improved keyboard.) The main appeal of the enhanced PC*jr*—and what IBM sees as its main market—is that parents who have IBM PCs at the office can take work home. Most PC software that requires only 128K will run on PC*jr*.

RADIO SHACK TRS-80 COLOR COMPUTER 2

The 16K Radio Shack Color Computer 2, priced at $159, is a new version of the popular Color Computer. This new "CoCo" runs all the software developed for its predecessor, including many cartridge games, some home productivity software, a spreadsheet, and a modified version of Logo. It can be used only with a TV.

Two other versions of the Color Computer 2 are available. One is the Extended Color Computer 2 ($199), which comes with a much more complete version of BASIC. A 64K version, also with Extended BASIC, costs $259.

The biggest change in the Color Computer 2 is a new typewriterstyle keyboard, replacing the "Chiclet"-style keys that were one of the older machine's biggest drawbacks. Like its predecessor, the keyboard has up, down, left, and right arrow cursor keys.

A word-processing program, *Color Scripsit*, is available for the Color Computer, but since the computer only displays uppercase characters, in a 32 × 16 (characters by lines) format, word processing on the CoCo is not ideal. *Color Scripsit* displays lowercase letters in inverse colors, and you can print in upper and lower case with a printer.

Software highlights include Walt Disney and Sesame Street learning programs, and *Micropainter*, an electronic "coloring book." The graphics on the basic CoCo aren't the greatest, but can be upgraded with the Extended Color BASIC ROM Kit ($39).

While there is plenty of Color Computer software, the CoCo won't run software written for the TRS-80 Models I, III, and 4.

Radio Shack sells a complete line of peripherals for the CoCo, including disk drives ($399 for the first one, and $279 for additional drives); a modem ($99); and a variety of printers, including an unusual color graphics printer that uses 4½-inch-wide paper ($199).

As with all Radio Shack computers, you can get support and service from thousands of Radio Shack outlets worldwide. This is a great advantage.

RADIO SHACK TRS-80 MODEL 4

The stripped down TRS-80 Model 4 ($999) comes with 16K, a full keyboard, and one thing none of the other computers here offer: a built-in black-and-white monitor.

At 16K, with no disk drive, the machine is limited—though Radio Shack does offer some cassette software, and all programs from the older Model III will run on the Model 4. You can use your own cassette recorder, which you cannot do on Atari or Commodore computers.

Also available is a 64K version of the Model 4, which comes with one disk drive ($1,699), or two ($1,999). These are powerful personal computers that run a wide variety of software. The Model 4 and its predecessors have developed an especially strong base of educational and financial software. Of course, due to the built-in black-and-white monitor, none of this software is displayed in color.

The Model 4 disk drives store 184K each, more than Apple or Commodore, but far less than the PC*jr*. You can add disk drives to a cassette-based Model 4 ($649 for the first, only $239 for the second), but you'll have to pay Radio Shack for installation.

The Model 4 has one of the best computer keyboards for touch-typing; the keyboard also includes four cursor-movement keys and a numeric keypad for rapid entry of numbers. On the disk-based Model 4, you can choose a screen display of 80 × 24 or 64 × 16 ("Model III mode"); the choice of 32 × 16 or 64 × 16 is available on the $999 model.

The Model 4 is a sturdy, reliable, and well-supported computer that is especially well-suited for small- and/or home-business applications. FC

—BILL HOWEY

A PREVIEW:

Apple IIc

APPLE HEADS FOR HOME

BY NICK SULLIVAN

This is a preview of the IIc, based on a brief look at one of the first production models, and on conversations with marketing and engineering staff at Apple headquarters. A full-fledged review of the IIc, based on extended use in a home setting, will follow in a future issue.

About 1.75 million Apple computers have been sold. And they keep selling. But the buyers keep changing.

In 1977, when Apple's first computer came out, the typical buyer was an electronics hobbyist with a soldering iron. In 1979, when the II plus came out and the spreadsheet program *VisiCalc* was written for it, the typical buyer was a businessperson. Over the next few years, schools began buying Apples. By 1983, when the Apple IIe hit the stores, a lot of the Fortune 500 buyers had gone over to the IBM PC, which came out in 1982. The IIe's main market was schools, small businesses, and consumers who wanted to run business or educational programs at home.

Enter the IIc.

This new extension of the long-lasting Apple II line has the clean lines and looks of a European electric coffee maker. It looks like the kind of friendly, modern appliance E.T. would want to take home. And Apple expects that many consumers will do just that. The company projects that 65 to 70 percent of IIc's sold will go into the home. Half of the buyers will be parents with young children—and an interest in education.

THE MACHO IS GONE

"We wanted to take the macho out of computers," says Peter Quinn, the chief hardware designer for both the IIe and the IIc. "We wanted a look that would make people say, 'That's an Apple.' " So Apple contracted with a German industrial-design firm, which had worked on such consumer products as the Sony Walkman, to develop some "crisp, fresh" colors (Apple Fog and Snow Beige) and build a sleek, transportable computer that would fit into a variety of home settings.

The IIc system unit, which includes the keyboard and a built-in disk drive on the right side, is light and small. It weighs 7.5 pounds, and measures 11.5 × 12 × 2 inches. In the back of the unit there's a handle (not visible here) for easy carrying. To use, the handle snaps down and tilts the keyboard up at a comfortable angle for typing.

But you can't judge a book by looking at the cover. The IIc, much more so than the IIe, is also easy to set up and use. "Spending $1,500 to $2,000 is a very brave purchase," says Dave Larson, marketing manager for the Apple II line. "You could buy a IIe for that, not know how to work it, and then at midnight find you didn't have anyone to call for help. We've tried to overcome those problems."

The IIc is basically ready to go when it comes out of the box. Let's take it out.

WHAT DOES "C" STAND FOR?

In many ways, the Apple IIc is just a souped-up, sportier, more portable version of the IIe. But there are enough improvements on the IIc—most of them gauged to appeal to novice home users—to make it new and different. Most noteworthy is its portability. Even with a built-in disk drive, it weighs just 7.5 pounds and is small enough to fit into a soft, padded carrying case ($40–$50) that

PHOTOGRAPHS BY ROGER RESSMEYER

slings over the shoulder. Though the price had not been firmed up at press time, the IIc is expected to sell for less than $1,300.

Keyboard. The IIc's keyboard is virtually identical in layout to the IIe's, though the key markings—in a light, italic typeface—are bigger and easier to read. The keys also give a reassuring click when pressed. And there's a nice extra: The keyboard is supposedly "drool-proof," with an underlying splash cloth that will catch spills and drain them out through the front vents.

For those who feel uncomfortable with keyboards, a mouse (less than $100) can be plugged into the back of the unit. The mouse is a small mechanical device that can be rolled on a tabletop to move the cursor. Clicking the button on the mouse allows you to choose from options on a menu.

Finally, if you don't like the standard "QWERTY" keyboard, you can flick a switch on the system unit that converts it to a Dvorak keyboard. This is an alternative keyboard that is said to be especially good for children, because many commonly used letters are in the middle row.

Disk Drive. The built-in IIc disk drive is basically the same one sold for the IIe. It has 143K storage capacity, and operates under both Apple DOS 3.3 and the newer ProDos disk operating systems. However, it's much smaller—"half-height." For this and other space-saving design reasons, the "c" in IIc stands for compact.

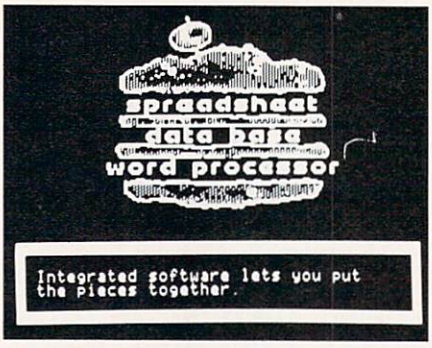
Memory/Screen Display. The Random Access Memory (RAM, the memory space available for the user) in the IIc is a sizable 128K. This is enough to run quite powerful programs, such as *Multiplan*, the hot-selling electronic spreadsheet. The Read Only Memory (ROM), which is built into the unit and contains Applesoft BASIC, is the same 16K size as in the IIe.

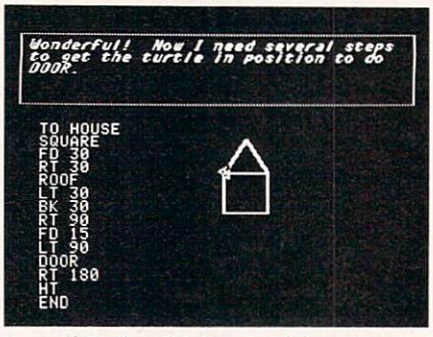
Text can be displayed across the screen in either a 40-character or 80-character format, both 24 lines deep. A thin click-button above the keyboard allows the user to switch from one text format to the other. So, imagine this scenario, as Apple already has:

The kids have the IIc, in 40-column format, hooked to a TV and are playing a fun/learning game in full color. Afterwards, Mom or Dad unhooks the IIc, carries it into the workroom, and connects it to a monitor employing the 80-column format for text display.

Color. The IIc has what Apple calls a "double high-resolution" screen display. This means the Apple IIc displays twice as many dots, or pixels, across the screen as the IIe does—translating into a sharper, better defined picture. For instance, with a monochrome monitor the resolution is a stunning 560 × 192, the number of pixels horizontally and vertically. (This compares with 280 × 192 on the Apple IIe.) With a color monitor or TV, the resolution is 140 × 192. This is the same as on the IIe, but the IIc can display 16 colors at once. Only six are available on the IIe. Given the high resolution, the extra colors, and some other changes that allow programmers more flexibility in the use of color, the "c" in IIc stands for both clarity and color.

Fact and Fiction Tool Kit **(Scholastic Wizware) is one of the first programs written for the IIc that makes use of both a mouse and the double hi-res, 16-color graphics. It enables you to draw colored pictures, add text in several different fonts, and print out a 12-page booklet.**





In one of the five disk-based training programs that come with the IIc, Apple uses a club sandwich to explain the parts of an "integrated" software package. Another training program describes how to draw a house using the Logo programming language. The training disks are "interactive tutorials" designed to complement the user's manual.

Software Compatibility. "C" also stands for compatibility. According to Apple, the IIc can run 95 percent of the 10,000 or so programs written for the Apple II line.

The *Swift's Catalog*, listing educational software for the Apple II line, is well over an inch thick. And, because Apple's research showed that people with children are twice as likely to buy a computer, many of the initial releases for the IIc are education or fun/learning packages. These include *The Apple Education Classics:* a Dvorak-keyboard version of *MasterType* (Scarborough); mouse-based versions of *Stickybears* (Xerox) and *Grandma's House* (Spinnaker); *Bank Street Writer*, with both 40- and 80-character displays (Broderbund); *Mastering the SAT* (CBS Software), with a built-in time clock and a tutorial; and *Fact and Fiction Tool Kit* (Scholastic Wizware), a mouse-driven program that allows you to create and print out a 12-page color booklet with both text and graphics.

For adults and/or professional users, new applications software includes *Access II* (a communications program from Apple); *Appleworks* (Apple's integrated word-processing, data base, and spreadsheet program); *Multiplan* (a spreadsheet from Microsoft); and *Dow Jones Investor* (a portfolio management program from Dow Jones). All software introduced for the IIc will run on the IIe, though in some cases 128K may be required.

Sound. Unfortunately, the IIc has been endowed with the same primitive sound capability as the IIe—that is, one beeper. This beeper, however, can be programmed (in machine language) to create an infinite number of tones. On the IIc there's a jack for headphones (the sound output will be mono). And there's a round volume-control knob. The IIe has neither of these features.

IIc VS. IIe

Except for its stylish looks, the IIc technically is not that far beyond a IIe. A IIe can be virtually turned into a IIc work-alike computer by inserting a few circuit boards, or cards. An Extended 80-Column Card (about $275) alone will give the IIe 128K RAM, an 80-column display, and double hi-res graphics—just what the IIc has.

The two computers differ primarily in their expansion potential. Unlike the IIc, the IIe is an open machine. You can take the top off, look inside, and, by buying the proper cards (plug-in circuit boards), configure it to your own needs. You can add a Mockingboard card, which acts as a

COLOR PHOTOGRAPH: SCHOLASTIC WIZWARE

music synthesizer, to make up for the relative lack of sound. You can add serial or parallel cards for modems or printers, a card for a mouse, an interface for an RGB (Red-Green-Blue) monitor, or a built-in time clock. You can add the CP/M operating system, and connect up to 14 disk drives. Etcetera.

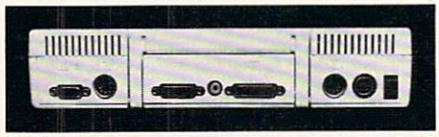
For many users, this flexibility is one of the primary attributes of the IIe. The machine can keep growing. Thus, Apple expects the IIe will still sell to avid computer hobbyists.

But building a computer like this—from the ground up—can be a messy, time-consuming, and expensive business. A lot of people don't want the aggravation, as Apple's research for the IIc revealed. So, to enter the consumer market, Apple made some changes.

IT'S ALL BUILT IN

The IIc is not designed to be opened and fiddled with, and there's not much need to. Along the back panel are seven ports, labeled with icons, which should fulfill most home needs. The cables that come with different peripherals—such as a printer or modem—are labeled with the same icons, to make the hookup a snap.

The built-in ports run from right to left, as follows: 1) a power-in port; 2) a serial port for printers; 3) a port to connect an external disk drive; 4) a jack for a monitor; 5) an "extended video port," into which you can plug a TV or a European monitor; 6) a serial port for a modem; 7) a port for a mouse or a joystick (the computer can tell which one is plugged in).



The back panel of the IIc has ports for various peripherals, such as a printer and a modem. Icons above the ports indicate what goes where.

Peripherals. A printer and a monitor are being introduced with the IIc. The Scribe, a seven-color printer that can mix text and graphics, sells for less than $300—a remarkably good price for a color printer. It's a "thermal transfer" printer that works by heating a wax on the ribbon, and transferring that wax to any kind of paper. The ribbon needs to be replaced after printing out about 45 pages. Apple's ImageWriter printer ($595), designed for heavier use, also works with the IIc, but does not print in color.

The 9-inch green-phosphor monitor sells for less than $250. Its display is extremely sharp and clear. The monitor comes with a tilt-stand, and its attractive lines complement the IIc system.

An external, "half-height" disk drive and a mouse were also brought out with the IIc.

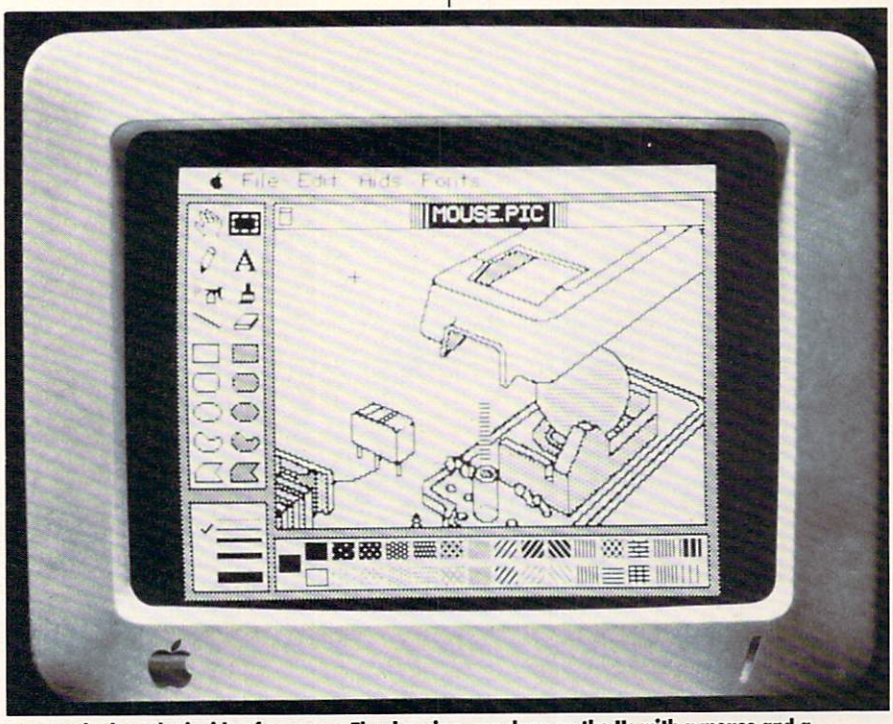
FIVE TUTORIALS MAKE LEARNING A BREEZE

Using a computer, hooking up a printer, or mastering a piece of software is never quite as easy as manufacturers would lead you to believe. It's easy once you learn, but learning is the hard part. Almost all computer developers are aware of this self-created credibility gap and now have the end-user in mind when designing products. Apple, having been in the business longer than most, is in the forefront.

The IIc comes with five training program disks. They're accompanied by a user's manual. You can go through the manual and the disk at the same time, and learn by doing. As educators say, "Show—don't tell."

Here's an example of how a tutorial program and the manual can work together. In its extensive research for the IIc, Apple found that a large percentage of potential computer buyers didn't know what software was. They thought users had to "program the machine" to make it do anything. So programming, like word processing, is treated in the IIc manual as just another application—something you can do if you want, but don't have to. Reading this in the manual, and then switching to disk for an "interactive tutorial," a user learns how to program by drawing a square, a house, etc., with Logo.

This perspective—this attention to the end-user—is unique. Since most computers (including the IIc) have built-in BASIC, that is the only language discussed in most users' manuals. While the IIc also includes a disk tutorial on BASIC, Apple gives Logo equal billing. Using Logo is an easy way to achieve immediate and gratifying results—and a sense of control over the computer.



Here's a look at the inside of a mouse. The drawing was done on the IIc with a mouse and a program called *MousePaint* (also available for the IIe). *MousePaint* is a very sophisticated drawing program.

And don't forget the mouse. As described above, it's a way to bypass the keyboard. Instead of memorizing a series of commands to operate a program, just click the button on the mouse. The mouse is certainly not the end-all and be-all—some who are used to keyboards find it annoying, and you still have to use the keyboard to type in words—but it's perfectly functional and amazingly easy to use. And, as a drawing tool, the mouse is superior to a joystick.

MORE FOR THE MONEY

The IIc offers a lot more for the money than does the IIe. While the IIe's price is decreasing, you'd have to spend at least another $750 to bring it up to par with the IIc. With its extremely large software base, built-in ports, solidity, and portability, the IIc seems to be a computer for professional, parent, and child. Not many computers fit that bill as well as the IIc. FC

PHOTOGRAPH: APPLE COMPUTER INC.

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Our experience makes Wizware different from all other educational software. It turns learning subjects like geography, writing and spelling into exciting adventures for your children. And because every Wizware game is *interactive,* kids become deeply involved in what they're learning.

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Based on the classic game of Capture-the-Flag, this is the most sophisticated and fun strategy game for kids available today. Not only do players learn how to devise complex strategies, they also learn how to work together to solve difficult problems.

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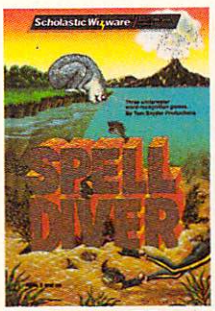
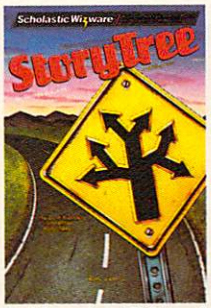
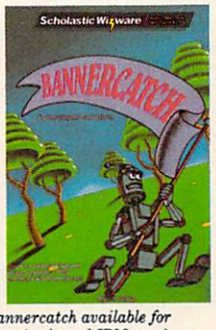
Scholastic™ Wizware



Spelldiver, Agent U.S.A. and Bannercatch designed and developed by Tom Snyder Productions, Inc. Story Tree designed and developed by George Brackett.





Spelldiver, Agent U.S.A. and Bannercatch available for Atari 800/1200/XL. Commodore, Apple and IBM versions available soon. Story Tree available for Apple.

See jane™ run

Once there was a time,

before the written word, when people used pictures to communicate. Symbols representing entire ideas were easy to see and understand. And the people were comfortable with this language. And they were happy.

But then came the computer.

And symbols were replaced by complicated commands. Soon data processing meant learning a whole new vocabulary. And the people became frightened of the new computer language. And they were sad.

Then came Jane.

Absolutely, positively, unequivocably, unquestionably, the most simple way to operate a computer.

Jane does away with the keyboard . Instead, a simple, hand-held device called a mouse selects from a variety of applications. From letters to lists, to calculations and spreadsheets. Jane does them all.

Jane does away with complex command words.

Instead, simple, easy-to-understand pictures tell the computer what to do.

From one operation to many, all on one screen at the same time.

Best of all, Jane doesn't cost lots of money. Now everyone can use a home computer. Jane gives back to the people a language they understand.

And they Jane. You can too.

One word is worth a thousand pictures.

See Jane run at Softcon '84.

jane

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Jane is now available for the Apple][,][+ [64K], //e, Commodore 64. Available soon for the new Atari™ series and the IBM PC™ and compatibles. Apple™, Commodore™, IBM™ and Atari™ are all registered trademarks.

the Programmer

ILLUSTRATION BY BARTON STABLER

★ J U N E ★

BEGINNER PROGRAMS
Page 74

Earn pocket money selling personalized disk labels. This Father's Day, forgo that polka-dot tie—give dad something out of the ordinary.

PUZZLE
Page 94

Something's cooking and it sure smells fishy! A puzzle of intrigue and aroma.

READER-WRITTEN PROGRAM
Page 106

A *Fishtank* you'll never have to clean. For the TI-99/4A.

ILLUSTRATION BY JIM CHERRY III

DISK LABEL MAKER

BY JOEY LATIMER

ILLUSTRATIONS BY JOSH GOSFIELD

This summer why not use your computer to earn money selling disk labels? *Disk Label Maker* prints an attractive border pattern on 1-inch by 3½-inch labels, which can be used on disks, spice jars, and file drawers, or as bookplates, etc.

When you run the program, you will be asked if you wish to include a one-line message within the border. Type "N" for a blank label, or type "Y" for a label message and then input no more than 23 characters. (Remember that spaces between words count as characters.) If you use a comma, enclose your whole message within quotation marks. When you are ready to print, press any key.

You can easily alter the border design (to substitute a programmer's name, for example) by changing the characters within quotation marks on lines 340 through 380. Be sure to keep the same number of characters as in the original, and retain the quotation marks.

This program can be used with different-size labels, simply by adjusting the position of the label paper in your printer so that the printed design will be centered.

You can also alter the border to fit the size of your labels. First, change the length of the label's top and bottom (horizontal) lines, by either adding or removing characters within the quotation marks in lines 340 and 380. Be sure to add or subtract the same number of characters in both lines.

You can only add or remove an even number of characters (for example 2, 4, or 6). Then, depending on your machine, increase or reduce the numbers 29, 31, and 33 wherever they appear in lines 10, 20, 350, 360, and 370 by the number of characters you've added or removed. Then increase or reduce the number 13, 16, or 17 in line 360 by half the number of characters you've added or subtracted in line 340. (For example: if an Apple owner adds four characters, he or she should change 33 to 37 in lines 350 and 370; 33 to 37 and 17 to 19 in line 360.) The number of characters allowed in the message can now be changed from 23, which appears once in line 10 (Atari only), once in line 220, and twice in line 240 (except Atari), to suit the new length.

To enlarge the label vertically, you can repeat line 350 (renumbering it 351, 352, etc.) and line 370 (renumbering it 371, 372, etc.) as often as you wish. Since line 360 prints your message, repeating line 370 more often than line 350 will create a greater number of blank lines underneath the message.

(Note: TI-99/4A owners should modify line 310 to `OPEN #1:"RS232"` if they are using a serial printer.)

ADAM/*Disk Label Maker*

```
50 HOME
60 i$ = ""
80 PRINT TAB(7); "DISK LABEL MAKER"
90 PRINT
100 PRINT "PLEASE PRESS <RETURN>"
110 PRINT "AFTER EACH REPLY."
120 PRINT
130 PRINT "DO YOU WANT SOMETHING"
140 PRINT "PRINTED ON THE LABEL";
150 INPUT r$
170 IF LEFT$(r$, 1) = "N" OR LEFT$(r$, 1) = "n" THEN 2
50
180 PRINT
189 REM  --input disk label text--
190 PRINT "WHAT WILL THE LABEL SAY?"
210 PRINT
220 PRINT "(23 LETTERS OR FEWER)"
230 INPUT i$
239 REM  --chop off extra characters--
240 IF LEN(i$) > 23 THEN i$ = LEFT$(i$, 23)
250 HOME
260 PRINT "WHEN PRINTER IS READY,"
270 PRINT "PLEASE PRESS ANY KEY."
280 GET r$
300 HOME
309 REM  --open printer channel--
310 PR #1
330 PRINT
339 REM  --print top border--
340 PRINT "*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
350 PRINT "*";SPC(33);"*"
359 REM  --center and print text--
360 PRINT "*";SPC((33-LEN(i$))/2);i$;SPC(17-LEN(i$)/2)
;"*"
370 PRINT "*";SPC(33);"*"
379 REM  --print bottom border
380 PRINT "*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
399 REM  --close printer channel--
400 PR #0
409 REM  --do it again or end--
410 PRINT "DO YOU WANT TO"
420 PRINT "MAKE ANOTHER";
430 INPUT r$
450 IF LEFT$(r$, 1) = "Y" OR LEFT$(r$, 1) = "y" THEN 5
0
460 END
```

Apple/*Disk Label Maker*

```
50 HOME
60 I$ = ""
80 PRINT TAB(12);"DISK LABEL MAKER"
90 PRINT
100 PRINT "PLEASE PRESS <RETURN>"
110 PRINT "AFTER EACH REPLY."
120 PRINT
130 PRINT "DO YOU WANT SOMETHING"
140 PRINT "PRINTED ON THE LABEL";
150 INPUT R$
170 IF LEFT$(R$,1) = "N" THEN 250
180 PRINT
189 REM --INPUT DISK LABEL TEXT--
190 PRINT "WHAT WILL THE LABEL SAY?"
210 PRINT
220 PRINT "(23 LETTERS OR FEWER)"
230 INPUT I$
239 REM --CHOP OFF EXTRA CHARACTERS--
240 IF LEN(I$) > 23 THEN I$ = LEFT$(I$,23)
250 HOME
260 PRINT "WHEN PRINTER IS READY,"
270 PRINT "PLEASE PRESS ANY KEY."
280 GET R$
300 HOME
309 REM --OPEN PRINTER CHANNEL--
310 PR#1
330 PRINT
```

IS YOUR CHILD TOP BANANA, OR JUST ONE OF THE BUNCH?

Kids everywhere are going ape over Artworx® Monkey Series educational software! Like all good arcade games, kids just can't stop playing them. Which is great, because while they're enjoying the antics of Marc the Monkey, they're learning. And growing.

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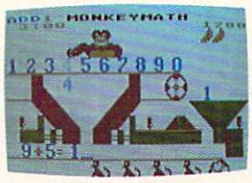

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Monkeynews

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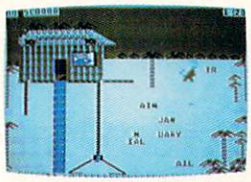
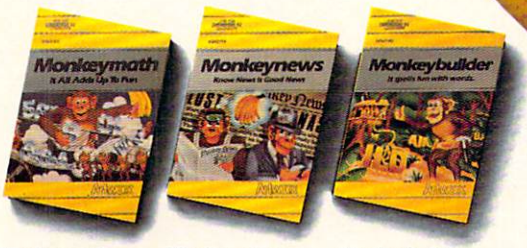

Monkeybuilder



Monkeymath
by Dennis Zander

Monkeynews
by Dennis Zander

Monkeybuilder
by Dean Kindig and Rob Fitter

Artworx®

Educational Software with a smile.

```
409 REM --DO IT AGAIN OR END--
410 PRINT "DO YOU WANT TO"
420 PRINT "MAKE ANOTHER";
430 INPUT R$
450 IF LEFT$(R$,1)="Y" OR LEFT$(R$,1)="y" THEN 50
460 END
```

TI-99/4A/*Disk Label Maker*

```
50 CALL CLEAR
60 I$=""
80 PRINT TAB(7);"DISK LABEL MAKER"
90 PRINT
100 PRINT "PLEASE PRESS <ENTER>"
110 PRINT "AFTER EACH REPLY."
120 PRINT
130 PRINT "DO YOU WANT SOMETHING"
140 PRINT "PRINTED ON THE LABEL";
150 INPUT R$
170 IF SEG$(R$,1,1)="N" OR SEG$(R$,1,1)="n" THEN 250
180 PRINT
189 REM --INPUT DISK LABEL TEXT--
190 PRINT "WHAT WILL THE LABEL SAY?"
210 PRINT
220 PRINT "(23 LETTERS OR FEWER)"
230 INPUT I$
239 REM --CHOP OFF EXTRA CHARACTERS--
240 IF LEN(I$)>23 THEN I$=SEG$(I$,1,23)
250 CALL CLEAR
260 PRINT "WHEN PRINTER IS READY,"
270 PRINT "PLEASE PRESS ANY KEY."
280 CALL KEY(0,K,S)
290 IF S=0 THEN 280
300 CALL CLEAR
309 REM --OPEN PRINTER CHANNEL--
310 OPEN #1:"PIO"
330 PRINT #1
339 REM --PRINT TOP BORDER--
340 PRINT #1:"*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
350 PRINT #1:"*";RPT$(" ",33);"*"
359 REM --CENTER AND PRINT TEXT--
360 PRINT #1:"*";RPT$(" ",(33-LEN(I$))/2);I$;RPT$(" ",
16-LEN(I$)/2);"*"
370 PRINT #1:"*";RPT$(" ",33);"*"
379 REM --PRINT BOTTOM BORDER--
380 PRINT #1:"*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
399 REM --CLOSE PRINTER CHANNEL--
400 CLOSE #1
409 REM --DO IT AGAIN OR END--
410 PRINT "DO YOU WANT TO"
420 PRINT "MAKE ANOTHER";
430 INPUT R$
450 IF SEG$(R$,1,1)="Y" OR SEG$(R$,1,1)="y" THEN 50
460 END
```

Timex Sinclair 1000, 1500, & 2068/*Disk Label Maker*

```
20 DIM S$(40)
50 CLS
60 LET I$=""
80 PRINT TAB 6;"DISK LABEL MAKER"
90 PRINT
100 PRINT "PLEASE PRESS <ENTER>"
110 PRINT "AFTER EACH REPLY."
120 PRINT
130 PRINT "DO YOU WANT SOMETHING"
140 PRINT "PRINTED ON THE LABEL?"
150 INPUT R$
170 IF R$(1)="N" THEN GOTO 250
180 PRINT
189 REM --INPUT DISK LABEL TEXT--
190 PRINT "WHAT WILL THE LABEL SAY?"
210 PRINT
220 PRINT "(23 LETTERS OR FEWER)"
230 INPUT I$
239 REM --CHOP OFF EXTRA CHARACTERS--
240 IF LEN I$>23 THEN LET I$=I$( TO 23)
250 CLS
260 PRINT "WHEN PRINTER IS READY,"
270 PRINT "PLEASE PRESS ANY KEY."
280 LET R$=INKEY$
290 IF R$="" THEN GOTO 280
300 CLS
330 LPRINT
339 REM --PRINT TOP BORDER--
340 LPRINT "*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
350 LPRINT "*";S$(1 TO 29);"*"
359 REM --CENTER AND PRINT TEXT--
360 LPRINT "*";S$(1 TO (31-LEN I$)/2);I$;S$(1 TO 13-LE
N I$/2);"*"
370 LPRINT "*";S$(1 TO 29);"*"
379 REM --PRINT BOTTOM BORDER--
380 LPRINT "*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
409 REM --DO IT AGAIN OR END--
410 PRINT "DO YOU WANT TO"
420 PRINT "MAKE ANOTHER?"
430 INPUT R$
450 IF R$(1)="Y" THEN GOTO 50
460 STOP
```

TRS-80 Color Computer/*Disk Label Maker*

```
50 CLS
60 I$=""
80 PRINT TAB(7);"DISK LABEL MAKER"
90 PRINT
100 PRINT "PLEASE PRESS <ENTER>"
110 PRINT "AFTER EACH REPLY."
120 PRINT
130 PRINT "DO YOU WANT SOMETHING"
140 PRINT "PRINTED ON THE LABEL";
150 INPUT R$
170 IF LEFT$(R$,1)="N" OR LEFT$(R$,1)="n" THEN 250
180 PRINT
189 REM --INPUT DISK LABEL TEXT--
190 PRINT "WHAT WILL THE LABEL SAY?"
210 PRINT
220 PRINT "(23 LETTERS OR FEWER)"
230 INPUT I$
239 REM --CHOP OFF EXTRA CHARACTERS--
240 IF LEN(I$)>23 THEN I$=LEFT$(I$,23)
250 CLS
260 PRINT "WHEN PRINTER IS READY,"
270 PRINT "PLEASE PRESS ANY KEY."
280 R$=INKEY$
290 IF R$="" THEN 280
300 CLS
330 PRINT#-2
339 REM --PRINT TOP BORDER--
340 PRINT#-2,"*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
350 PRINT#-2,"*";STRING$(33,32);"*"
359 REM --CENTER AND PRINT TEXT--
360 PRINT#-2,"*";STRING$((33-LEN(I$))/2,32);I$;STRING$
(17-LEN(I$)/2,32);"*"
370 PRINT#-2,"*";STRING$(33,32);"*"
379 REM --PRINT BOTTOM BORDER--
380 PRINT#-2,"*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
409 REM --DO IT AGAIN OR END--
410 PRINT "DO YOU WANT TO"
420 PRINT "MAKE ANOTHER";
430 INPUT R$
450 IF LEFT$(R$,1)="Y" OR LEFT$(R$,1)="y" THEN 50
460 END
```

TRS-80 Model III/*Disk Label Maker*

```
10 CLEAR 100
50 CLS
60 I$=""
80 PRINT TAB(24);"DISK LABEL MAKER"
90 PRINT
100 PRINT "PLEASE PRESS <ENTER>"
110 PRINT "AFTER EACH REPLY."
120 PRINT
130 PRINT "DO YOU WANT SOMETHING"
140 PRINT "PRINTED ON THE LABEL";
150 INPUT R$
170 IF LEFT$(R$,1)="N" OR LEFT$(R$,1)="n" THEN 250 →
```

A TRS-80® Color Computer 2 Makes Learning Child's Play

Our TRS-80 Extended BASIC Color Computer 2 is an exciting learning tool that entertains while it educates. Just hook it up to any TV and you have a valuable home learning system in your living room. With the excellent line of programs developed by The Children's Television Workshop, the creators of Sesame Street®, children are encouraged to play constructively and learn actively through the use of vivid color graphics and engaging sound effects. And since the level of difficulty and pacing of the game are under the player's control, your child will progress in his or her unique way. The first series of programs for ages 3 thru 6 uses the popular Sesame Street characters to encourage practice of basic preschool skills. Choose *Grover's Number Rover*™, *Ernie's Magic Shapes*™, *Big Bird's Special Delivery*™ or *Cookie Monster's Letter Crunch*™.

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Prices apply at participating Radio Shack stores and dealers. TV, cassette recorder and joysticks sold separately. Programs © 1983 Children's Computer Workshop, Inc. All rights reserved. Muppet characters are trademarks of Muppets, Inc. Sesame Street is a registered trademark of Children's Television Workshop. All other titles are trademarkds of Children's Computer Workshop, Inc. CitiLine is a service mark of Citicorp.

```
180 PRINT
189 REM --INPUT DISK LABEL TEXT--
190 PRINT "WHAT WILL THE LABEL SAY?"
210 PRINT
220 PRINT "(23 LETTERS OR FEWER)"
230 INPUT I$
239 REM --CHOP OFF EXTRA CHARACTERS--
240 IF LEN(I$)>23 THEN I$=LEFT$(I$,23)
250 CLS
260 PRINT "WHEN PRINTER IS READY,"
270 PRINT "PLEASE PRESS ANY KEY."
280 R$=INKEY$
290 IF R$="" THEN 280
300 CLS
330 LPRINT
339 REM --PRINT TOP BORDER--
340 LPRINT "*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
350 LPRINT "*";STRING$(33,32);"*"
359 REM --CENTER AND PRINT TEXT--
360 LPRINT "*";STRING$((33-LEN(I$))/2,32);I$;STRING$(1
7-LEN(I$)/2,32);"*"
370 LPRINT "*";STRING$(33,32);"*"
379 REM --PRINT BOTTOM BORDER--
380 LPRINT "*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
409 REM --DO IT AGAIN OR END--
410 PRINT "DO YOU WANT TO"
420 PRINT "MAKE ANOTHER";
430 INPUT R$
450 IF LEFT$(R$,1)="Y" OR LEFT$(R$,1)="y" THEN 50
460 END
```

TRS-80 Model 4/*Disk Label Maker*

```
50 CLS
60 I$=""
80 PRINT TAB(32);"DISK LABEL MAKER"
90 PRINT
100 PRINT "PLEASE PRESS <ENTER>"
110 PRINT "AFTER EACH REPLY."
120 PRINT
130 PRINT "DO YOU WANT SOMETHING"
140 PRINT "PRINTED ON THE LABEL";
150 INPUT R$
160 IF LEFT$(R$,1)="N" OR LEFT$(R$,1)="n" THEN 250
170 PRINT
180 PRINT "WHAT WILL THE LABEL SAY?"
189 REM --INPUT DISK LABEL TEXT--
210 PRINT
220 PRINT "(23 LETTERS OR FEWER)"
230 INPUT I$
239 REM --CHOP OFF EXTRA CHARACTERS--
240 IF LEN(I$)>23 THEN I$=LEFT$(I$,23)
250 CLS
260 PRINT "WHEN YOUR PRINTER IS READY,"
270 PRINT "PLEASE PRESS ANY KEY."
280 R$=INKEY$
290 IF R$="" THEN 280
300 CLS
330 LPRINT
339 REM --PRINT TOP BORDER--
340 LPRINT "*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
350 LPRINT "*";STRING$(33,32);"*"
359 REM --CENTER AND PRINT TEXT--
360 LPRINT "*";STRING$((33-LEN(I$))/2,32);I$;STRING$(1
6-LEN(I$)/2,32);"*"
370 LPRINT "*";STRING$(33,32);"*"
379 REM --PRINT BOTTOM BORDER--
380 LPRINT "*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
409 REM --DO IT AGAIN OR END--
410 PRINT "DO YOU WISH TO"
420 PRINT "MAKE ANOTHER";
430 INPUT R$
450 IF LEFT$(R$,1)="Y" OR LEFT$(R$,1)="y" THEN 50
460 END
```

VIC-20/*Disk Label Maker*

```
50 PRINT CHR$(147);
60 I$=""
80 PRINT TAB(3);"DISK LABEL MAKER"
90 PRINT
100 PRINT "PLEASE PRESS <RETURN>"
110 PRINT "AFTER EACH REPLY."
120 PRINT
130 PRINT "DO YOU WANT SOMETHING"
140 PRINT "PRINTED ON THE LABEL";
150 INPUT R$
170 IF LEFT$(R$,1)="N" THEN 250
180 PRINT
189 REM --INPUT DISK LABEL TEXT--
190 PRINT "WHAT WILL THE"
200 PRINT "LABEL SAY?"
210 PRINT
220 PRINT "(23 LETTERS OR FEWER)"
230 INPUT I$
239 REM --CHOP OFF EXTRA CHARACTERS--
240 IF LEN(I$)>23 THEN I$=LEFT$(I$,23)
250 PRINT CHR$(147);
260 PRINT "WHEN PRINTER IS READY,"
270 PRINT "PLEASE PRESS ANY KEY."
280 GET R$
290 IF R$="" THEN 280
300 PRINT CHR$(147);
309 REM --OPEN PRINTER CHANNEL--
310 OPEN 4,4
320 CMD 4
330 PRINT
339 REM --PRINT TOP BORDER--
340 PRINT "*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
350 PRINT "*";SPC(33);"*"
359 REM --CENTER AND PRINT TEXT--
360 PRINT "*";SPC((33-LEN(I$))/2);I$;SPC(17-LEN(I$)/2)
;"*"
370 PRINT "*";SPC(33);"*"
379 REM --PRINT BOTTOM BORDER--
380 PRINT "*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*-*"
390 PRINT#4
399 REM --CLOSE PRINTER CHANNEL--
400 CLOSE 4
409 REM --DO IT AGAIN OR END--
410 PRINT "DO YOU WANT TO"
420 PRINT "MAKE ANOTHER";
430 INPUT R$
450 IF LEFT$(R$,1)="Y" THEN 50
460 END
```

TIPS TO THE TYPIST

1. When you type program lines into your computer, be sure to copy them *exactly* as written. Numbers, punctuation marks, and spaces are very important!

2. Remember to press RETURN or ENTER *after* every completed program line.

3. Run the program when you finish typing it in by typing RUN and pressing the RETURN or ENTER key. If the computer gives you an error message, don't panic. Mistakes can be fixed. List the program by typing the word LIST and pressing the RETURN or ENTER key and double-check each line. A foolproof way to correct a mistake is to type in the entire line again (including its line number). When you list the program again, you should find the new line in place of the old.

4. If you need more help, read the programming guide written for your computer. It will answer questions that can't possibly be covered here.

5. When all else fails . . . turn off the computer and relax.

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FATHER'S DAY CARD

BY JOEY LATIMER

It's Father's Day. Imagine this scene: Knock-knock. "Don't come in, Dad!" "Why not?" "Because." "Because why?" "Just because!" Your dad may be puzzled, but his puzzlement will turn to smiles when he discovers what you were doing behind that closed door on June 17: preparing a computerized *Father's Day Card!*

First close the door. RUN the program, and answer the questions. Keep in mind that 1 is lousy and 10 is fantastic. Now call your dad into the room. Ask him to sit in front of the computer and press the RETURN or ENTER key. Then watch his puzzlement turn to joy as he receives a *Father's Day Card* like never before!

ADAM/*Father's Day Card*

```
10 HOME
20 PRINT "FATHER'S DAY CARD"
30 PRINT
40 PRINT "PLEASE PRESS <RETURN> AFTER"
50 PRINT "EACH REPLY."
60 PRINT
70 INPUT "WHAT IS YOUR NAME?";n$
80 PRINT
90 PRINT "TELL ME, ";n$;" ..."
99 REM -- START INPUT LOOP --
100 FOR x = 1 TO 3
110 READ t$,v$
120 IF x > 1 THEN HOME
130 PRINT "WHAT ";t$;" DOES YOUR FATHER"
140 PRINT v$;"?"
150 PRINT
160 PRINT "(7 LETTERS OR FEWER, PLEASE.)"
170 PRINT
180 PRINT "HE ";LEFT$(v$,4);"S ";RIGHT$(v$,LEN(v$)-5);
190 INPUT c$(x)
200 IF LEN(c$(x)) > 7 THEN 150
209 REM -- RATE DAD --
210 HOME
220 PRINT "ON A SCALE OF 1 TO 10,"
230 PRINT "HOW GOOD IS YOUR DAD AT"
240 PRINT RIGHT$(v$,LEN(v$)-5);" ";c$(x);
250 INPUT s(x)
260 IF s(x) < 1 OR s(x) > 10 THEN 210
270 NEXT x
279 REM -- END OF INPUT LOOP --
280 HOME
290 PRINT "PRESS <RETURN>,"
300 PRINT "THEN GET YOUR DAD."
310 GET r$
320 IF r$ <> CHR$(13) THEN 310
330 HOME
340 PRINT "HI DAD!"
350 PRINT "PRESS <RETURN> TO SEE"
360 PRINT "HOW GOOD YOU ARE AT ..."
370 GET r$
380 IF r$ <> CHR$(13) THEN 370
389 REM -- PRINT LABELS --
390 GR
400 HOME
410 PRINT "PLAYING";TAB(9);"DOING";TAB(16);"PLAYING";T
AB(24);"BEING A"
420 PRINT c$(1);TAB(9);c$(2);TAB(16);c$(3);TAB(24);"FA
THER"
429 REM -- DRAW GRAPHICS --
430 s(4) = 17
440 FOR x = 0 TO 30 STEP 10
450 q = x/10+1
460 COLOR = q+10
470 FOR ro = 35 TO 35-s(q)*2 STEP -1
480 HLIN x,x+9 AT ro
490 NEXT ro
500 NEXT x
510 PRINT TAB(7);"HAPPY FATHER'S DAY!"
520 PRINT TAB(24-LEN(n$));"LOVE, ";n$;
530 GET r$
540 TEXT
550 END
1000 DATA SPORT,LIKE PLAYING
1010 DATA CHORE,HATE DOING
1020 DATA GAME,LIKE PLAYING
```

Apple/*Father's Day Card*

```
10 HOME
20 PRINT "FATHER'S DAY CARD"
30 PRINT
40 PRINT "PLEASE PRESS <RETURN> AFTER EACH REPLY."
50 PRINT
60 INPUT "WHAT IS YOUR FIRST NAME?";N$
70 PRINT
80 PRINT "TELL ME, ";N$;" ..."
89 REM -- START INPUT LOOP --
90 FOR X = 1 TO 3
100 READ T$,V$
110 IF X > 1 THEN HOME
120 PRINT "WHAT ";T$;" DOES YOUR FATHER"
130 PRINT V$;"?"
140 PRINT
150 PRINT "(9 LETTERS OR FEWER, PLEASE.)"
160 PRINT
170 PRINT "HE ";LEFT$(V$,4);"S ";RIGHT$(V$,LEN(V$)-5);
180 INPUT C$(X)
190 IF LEN(C$(X)) > 9 THEN 140
199 REM -- RATE DAD --
200 HOME
210 PRINT "ON A SCALE OF 1 TO 10,"
220 PRINT "HOW GOOD IS YOUR DAD"
230 PRINT "AT ";RIGHT$(V$,LEN(V$)-5);" ";C$(X);
240 INPUT S(X)
250 IF S(X) < 1 OR S(X) > 10 THEN 200
260 NEXT X
269 REM -- END OF INPUT LOOP --
270 HOME
280 PRINT "PRESS <RETURN>, THEN GET YOUR DAD."
290 GET R$
300 IF R$ <> CHR$(13) THEN 290
310 HOME
320 PRINT "HI DAD!"
330 PRINT "PRESS <RETURN> TO SEE"
340 PRINT "HOW GOOD YOU ARE AT ..."
350 GET R$
360 IF R$ <> CHR$(13) THEN 350
369 REM -- PRINT LABELS --
```

→

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```
370 GR
380 HOME
390 PRINT "PLAYING";TAB(11);"DOING";TAB(21);"PLAYING";
TAB(31);"BEING A"
400 PRINT C$(1);TAB(11);C$(2);TAB(21);C$(3);TAB(31);"F
ATHER"
409 REM -- DRAW GRAPHICS --
410 S(4) = 19
420 FOR X = 0 TO 30 STEP 10
430 Q = X / 10 + 1
440 COLOR= Q
450 FOR RO = 39 TO 39 - S(Q) * 2 STEP -1
460 HLIN X,X + 8 AT RO
470 NEXT RO
480 NEXT X
490 PRINT TAB(10);"HAPPY FATHER'S DAY!"
500 PRINT TAB(33 - LEN(N$));"LOVE, ";N$;
510 GET R$
520 TEXT
530 END
1000 DATA SPORT,LIKE PLAYING
1010 DATA CHORE,HATE DOING
1020 DATA GAME,LIKE PLAYING
```

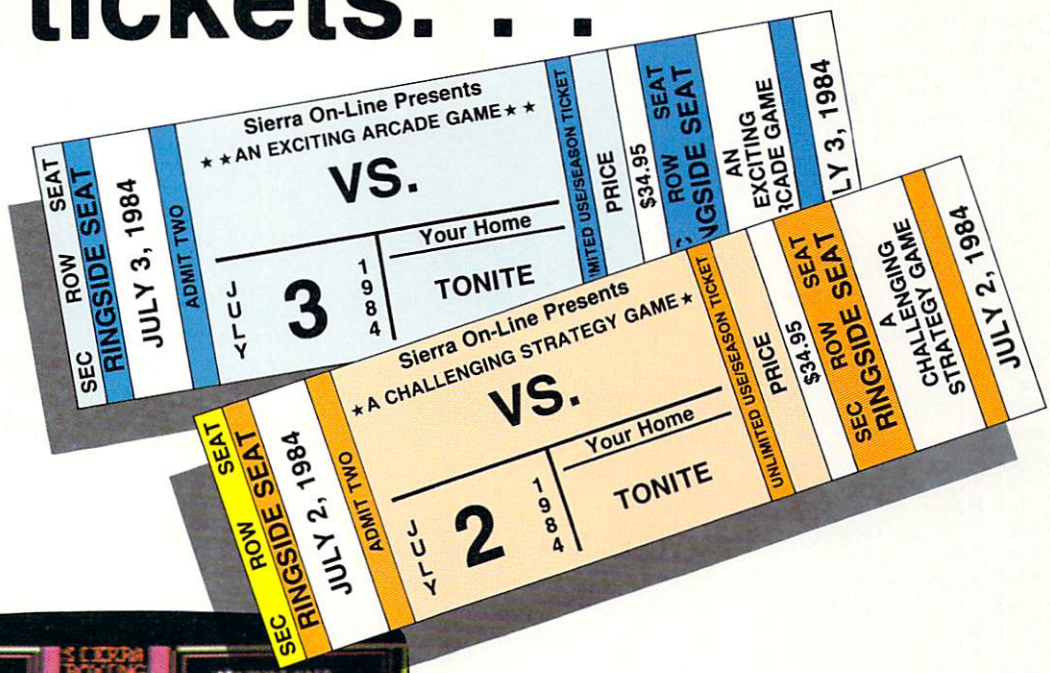
Atari/*Father's Day Card*

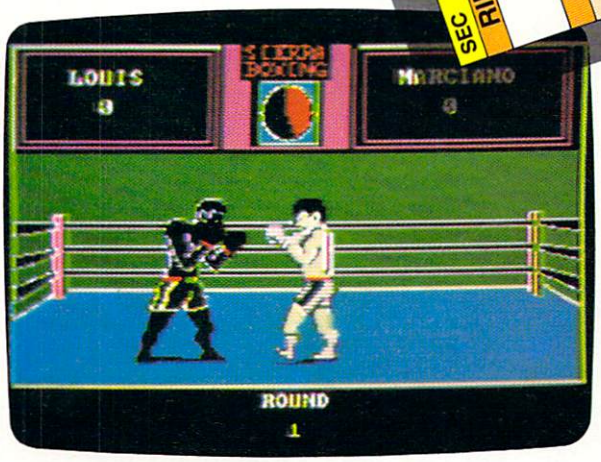
```
10 DIM C$(100),C(4,2),S(4),N$(20),T$(20),V$(20),IN$(50
)
20 POKE 82,0
30 OPEN #1,4,0,"K:"
40 PRINT CHR$(125);"FATHER'S DAY CARD"
50 PRINT
60 PRINT "PLEASE PRESS <RETURN> AFTER EACH REPLY."
70 PRINT
80 PRINT "WHAT IS YOUR FIRST NAME";
90 INPUT N$
100 PRINT
110 PRINT "TELL ME, ";N$;" ..."
119 REM -- START INPUT LOOP --
120 FOR X=1 TO 3
130 READ T$,V$
140 IF X>1 THEN PRINT CHR$(125);
150 PRINT "WHAT ";T$;" DOES YOUR FATHER"
160 PRINT V$;"?"
170 PRINT
180 PRINT "(9 LETTERS OR FEWER, PLEASE.)"
190 PRINT
200 PRINT "HE ";V$(1,4);"S ";V$(6,LEN(V$));
210 INPUT IN$
220 IF LEN(IN$)>9 THEN 170
230 C(X,1)=LEN(C$)+1
240 C$(C(X,1))=IN$
250 C(X,2)=LEN(C$)
259 REM -- RATE DAD --
260 PRINT CHR$(125);"ON A SCALE OF 1 TO 10, HOW GOOD I
S"
270 PRINT "YOUR FATHER AT ";V$(6,LEN(V$));" ";IN$;
280 TRAP 280
290 INPUT S
300 IF S<1 OR S>10 THEN 260
310 S(X)=S
320 NEXT X
329 REM -- END OF INPUT LOOP --
330 PRINT CHR$(125);"PRESS <RETURN>, THEN GET YOUR DAD
."
340 GET #1,R
350 IF R<>155 THEN 340
360 PRINT CHR$(125);"HI DAD!"
370 PRINT "PRESS <RETURN> TO SEE HOW GOOD YOU"
380 PRINT "ARE AT ..."
390 GET #1,R
400 IF R<>155 THEN 390
409 REM -- PRINT LABELS --
410 C(4,1)=LEN(C$)+1
420 C$(C(4,1))="A FATHER"
430 C(4,2)=LEN(C$)
440 S(4)=12
449 REM -- DRAW GRAPHICS --
450 GRAPHICS 3
460 POKE 752,1
470 RESTORE
480 FOR X=1 TO 4
490 READ T$,V$
500 POKE 657,(X-1)*10
510 PRINT V$(6,LEN(V$))
520 POKE 657,(X-1)*10
530 PRINT C$(C(X,1),C(X,2));CHR$(28);
540 NEXT X
550 FOR X=0 TO 3
560 COLOR 1
570 IF X=3 THEN COLOR 2
580 FOR RO=19 TO 19-(S(X+1)*1.5) STEP -1
590 PLOT X*10,RO
600 DRAWTO X*10+7,RO
610 NEXT RO
620 NEXT X
630 PRINT
640 PRINT
650 PRINT "           HAPPY FATHER'S DAY!"
660 POKE 657,33-LEN(N$)
670 PRINT "LOVE, ";N$;
680 GET #1,R
690 END
1000 DATA SPORT,LIKE PLAYING
1010 DATA CHORE,HATE DOING
1020 DATA GAME,LIKE PLAYING
1030 DATA NULL,NULL BEING
```

Commodore 64/*Father's Day Card*

```
10 PRINT CHR$(147);"FATHER'S DAY CARD"
20 PRINT
30 PRINT "PLEASE PRESS <RETURN> AFTER EACH REPLY."
40 PRINT
50 INPUT "WHAT IS YOUR FIRST NAME";N$
60 PRINT
70 PRINT "TELL ME, ";N$;" ..."
79 REM -- START INPUT LOOP --
80 FOR X=1 TO 3
90 IF X>1 THEN PRINT CHR$(147)
100 READ T$,V$
110 PRINT "WHAT ";T$;" DOES YOUR FATHER"
120 PRINT V$;"?"
130 PRINT
140 PRINT "(10 LETTERS OR FEWER, PLEASE.)"
150 PRINT
160 PRINT "HE ";LEFT$(V$,4);"S ";RIGHT$(V$,LEN(V$)-5);
170 INPUT C$(X)
180 IF LEN(C$(X))>10 THEN 130
189 REM -- RATE DAD --
190 PRINT CHR$(147);"ON A SCALE OF 1 TO 10, HOW GOOD I
S"
200 PRINT "YOUR DAD AT ";RIGHT$(V$,LEN(V$)-5);" ";C$(X
);
210 INPUT S(X)
220 IF S(X)<1 OR S(X)>10 THEN 190
230 NEXT X
239 REM -- END OF INPUT LOOP --
240 PRINT CHR$(147);"PRESS <RETURN>, THEN GET YOUR DAD
."
250 GET R$
260 IF R$<>CHR$(13) THEN 250
270 PRINT CHR$(147);"HI DAD!"
```

Your tickets. . .





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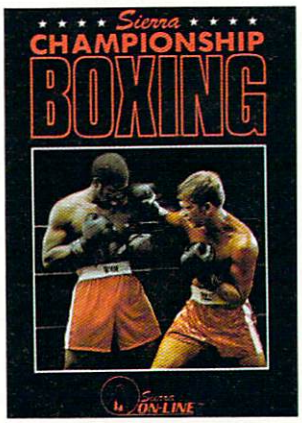

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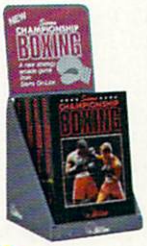

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```
280 PRINT "PRESS <RETURN> TO SEE"
290 PRINT "HOW GOOD YOU ARE AT ..."
300 GET R$
310 IF R$<>CHR$(13) THEN 300
319 REM -- PRINT LABELS --
320 PRINT CHR$(147)
330 POKE 53280,0
340 POKE 53281,0
350 FOR X=1 TO 20
360 PRINT
370 NEXT X
380 C$(4)="A FATHER"
390 S(4)=14
400 RESTORE
410 FOR X=0 TO 30 STEP 10
420 READ T$,V$
430 PRINT CHR$(5);TAB(X);RIGHT$(V$,LEN(V$)-5)
440 PRINT TAB(X);C$(X/10+1);CHR$(145);
450 NEXT X
459 REM -- DRAW GRAPHICS --
460 FOR X=0 TO 30 STEP 10
470 READ KO
480 FOR RO=19 TO 18-S(X/10+1) STEP -1
490 FOR CO=X TO X+8
500 POKE 55296+CO+40*RO,KO
510 POKE 1024+CO+40*RO,160
520 NEXT CO
530 NEXT RO
540 NEXT X
550 PRINT
560 PRINT
570 PRINT CHR$(158);TAB(10);"HAPPY FATHER'S DAY!"
580 PRINT TAB(33-LEN(N$));"LOVE, ";N$
590 GET R$
600 IF R$="" THEN 590
610 END
1000 DATA SPORT,LIKE PLAYING
1010 DATA CHORE,HATE DOING
1020 DATA GAME,LIKE PLAYING
1030 DATA NULL,NULL BEING
1040 DATA 4,6,7,2
```

IBM PCs/*Father's Day Card*

```
10 WIDTH 40
20 SCREEN 0,1
30 COLOR 7,0
40 KEY OFF
50 CLS
60 PRINT "FATHER'S DAY CARD"
70 PRINT
80 PRINT "PLEASE PRESS <ENTER> AFTER EACH REPLY."
90 PRINT
100 INPUT "WHAT IS YOUR FIRST NAME";N$
110 PRINT
120 PRINT "TELL ME, ";N$;" ..."
129 REM -- START INPUT LOOP --
130 FOR X=1 TO 3
140 READ T$,V$
150 IF X>1 THEN CLS
160 PRINT "WHAT ";T$;" DOES YOUR FATHER"
170 PRINT V$;"?"
180 PRINT
190 PRINT "(9 LETTERS OR FEWER, PLEASE.)"
200 PRINT
210 PRINT "HE ";LEFT$(V$,4);"S ";RIGHT$(V$,LEN(V$)-5);
220 INPUT C$(X)
230 IF LEN(C$(X))>9 THEN 190
239 REM -- RATE DAD --
240 CLS
250 PRINT "ON A SCALE OF 1 TO 10,"
260 PRINT "HOW GOOD IS YOUR DAD AT"
270 PRINT RIGHT$(V$,LEN(V$)-5);" ";C$(X);
280 INPUT S(X)
290 IF S(X)<1 OR S(X)>10 THEN 240
300 NEXT X
309 REM -- END OF INPUT LOOP --
310 CLS
320 PRINT "PRESS <ENTER>, THEN GET YOUR DAD."
330 R$=INKEY$
340 IF R$<>CHR$(13) THEN 330
350 CLS
360 PRINT "HI DAD!"
370 PRINT "PRESS <ENTER> TO SEE"
380 PRINT "HOW GOOD YOU ARE AT ..."
390 R$=INKEY$
400 IF R$<>CHR$(13) THEN 390
409 REM -- PRINT LABELS --
410 CLS
420 LOCATE 18,1
430 PRINT "PLAYING";TAB(11);"DOING";TAB(21);"PLAYING";
TAB(31);"BEING"
440 PRINT C$(1);TAB(11);C$(2);TAB(21);C$(3);TAB(31);"A
 FATHER"
449 REM -- DRAW GRAPHICS --
450 S(4)=14
460 FOR X=1 TO 31 STEP 10
470 Q=INT(X/10)+1
480 COLOR Q
490 FOR RO=17 TO 15-S(Q) STEP -1
500 FOR CO=X TO X+8
510 LOCATE RO,CO
520 PRINT CHR$(219)
530 NEXT CO
540 NEXT RO
550 NEXT X
560 COLOR 14
570 LOCATE 21,10
580 PRINT "HAPPY FATHER'S DAY!"
590 LOCATE 23,1
600 PRINT TAB(33-LEN(N$));"LOVE, ";N$
610 R$=INKEY$
620 IF R$="" THEN 610
630 END
1000 DATA SPORT,LIKE PLAYING
1010 DATA CHORE,HATE DOING
1020 DATA GAME,LIKE PLAYING
```

TI-99/4A w/TI BASIC/*Father's Day Card*

```
10 P$="FFFFFFFFFFFFFFFF"
20 FOR X=128 TO 152 STEP 8
30 READ SET,C
40 CALL CHAR(X,P$)
50 CALL COLOR(SET,C,C)
60 NEXT X
70 CALL CLEAR
80 PRINT "FATHER'S DAY CARD"
90 PRINT
100 PRINT "PLEASE PRESS <ENTER>"
110 PRINT "AFTER EACH REPLY."
120 PRINT
130 PRINT "WHAT IS YOUR FIRST NAME?"
140 INPUT N$
150 PRINT
160 PRINT "TELL ME, ";N$;" ..."
169 REM  -- START INPUT LOOP --
170 FOR X=1 TO 3
180 READ T$,V$
190 IF X<2 THEN 210
200 CALL CLEAR
210 PRINT "WHAT ";T$;" DOES YOUR FATHER"
220 PRINT V$;"?"
230 PRINT
```

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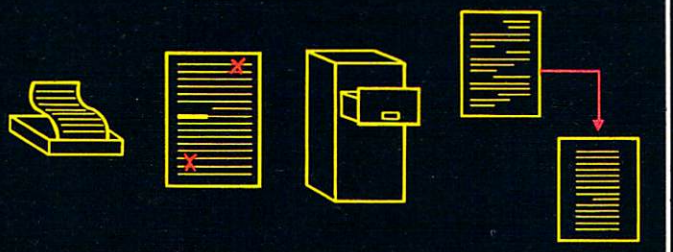

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```
240 PRINT "(10 LETTERS OR FEWER,"
250 PRINT "PLEASE.)"
260 PRINT
270 PRINT "HE ";SEG$(V$,1,4);"S ";SEG$(V$,6,LEN(V$))
280 INPUT C$(X)
290 IF LEN(C$(X))<1 THEN 230
300 IF LEN(C$(X))>10 THEN 230
309 REM  -- RATE DAD --
310 CALL CLEAR
320 PRINT "ON A SCALE OF 1 TO 10,"
330 PRINT "HOW GOOD IS YOUR DAD"
340 PRINT "AT ";SEG$(V$,6,LEN(V$));" ";C$(X);
350 INPUT S(X)
360 IF S(X)<1 THEN 310
370 IF S(X)>10 THEN 310
380 NEXT X
389 REM  -- END OF INPUT LOOP --
390 CALL CLEAR
400 PRINT "PRESS <ENTER>,"
410 PRINT "THEN GET YOUR DAD."
420 CALL KEY(0,R,B)
430 IF R<>13 THEN 420
440 CALL CLEAR
450 PRINT "HI DAD!"
460 PRINT "PRESS <ENTER> TO SEE"
470 PRINT "HOW GOOD YOU ARE AT ..."
480 CALL KEY(0,R,B)
490 IF R<>13 THEN 480
499 REM  -- PRINT LABELS --
500 CALL CLEAR
510 RESTORE 1010
520 C$(4)="A FATHER"
530 S(4)=16
540 FOR X=1 TO 4
550 READ T$,V$
560 PRINT SEG$(V$,6,LEN(V$))
570 PRINT C$(X)
580 PRINT
590 PRINT
600 NEXT X
609 REM  -- DRAW GRAPHICS --
610 FOR X=8 TO 20 STEP 4
620 Q=INT((X-8)/4)+1
630 CH=(Q-1)*8+128
640 FOR CO=13 TO S(Q)+13
650 CALL HCHAR(X,CO,CH)
660 CALL HCHAR(X+1,CO,CH)
670 NEXT CO
680 NEXT X
690 PRINT
700 PRINT
710 PRINT TAB(5);"HAPPY FATHER'S DAY!"
720 PRINT
730 PRINT TAB(21-LEN(N$));"LOVE, ";N$
740 CALL KEY(0,R,B)
750 IF B=0 THEN 740
760 END
1000 DATA 13,11,14,6,15,16,16,7
1010 DATA SPORT,LIKE PLAYING
1020 DATA CHORE,HATE DOING
1030 DATA GAME,LIKE PLAYING
1040 DATA NULL,NULL BEING
```

Timex Sinclair 1000 w/16K RAM Pack & Timex Sinclair 1500/*Father's Day Card*

```
10 DIM S(4)
20 DIM C$(4,12)
30 CLS
40 SLOW
50 PRINT "FATHERS DAY CARD"
60 PRINT
70 PRINT "PLEASE PRESS <ENTER> AFTER EACH REPLY."
80 PRINT
90 PRINT "WHAT IS YOUR FIRST NAME?"
100 INPUT N$
110 PRINT
120 PRINT "TELL ME, ";N$;" ..."
129 REM -- START INPUT LOOP --
130 FOR X=1 TO 3
140 IF X>1 THEN CLS
150 GOSUB X*1000
160 PRINT "WHAT ";T$;" DOES YOUR FATHER"
170 PRINT V$;"?"
180 PRINT
190 PRINT "(10 LETTERS OR FEWER, PLEASE.)"
200 PRINT
210 PRINT "HE ";V$(1 TO 4);"S ";V$(6 TO );" ..."
220 INPUT F$
230 IF LEN F$>10 OR LEN F$<1 THEN GOTO 180
240 LET C$(X)=F$
250 LET C$(X,11 TO 12)=STR$ LEN F$
259 REM -- RATE DAD --
260 CLS
270 PRINT "ON A SCALE OF 1 TO 10,"
280 PRINT "HOW GOOD IS YOUR DAD AT"
290 PRINT V$(6 TO );" ";C$(X,1 TO VAL C$(X,11 TO 12));
"?"
300 INPUT S(X)
310 IF S(X)<1 OR S(X)>10 THEN GOTO 260
320 NEXT X
329 REM -- END OF INPUT LOOP --
330 CLS
340 PRINT "PRESS <ENTER>, THEN GET","YOUR DAD."
350 LET R$=INKEY$
360 IF R$<>CHR$ 118 THEN GOTO 350
370 CLS
380 PRINT "HI DAD."
390 PRINT "PRESS <ENTER> TO SEE"
400 PRINT "HOW GOOD YOU ARE AT ..."
410 LET R$=INKEY$
420 IF R$<>CHR$ 118 THEN GOTO 410
429 REM -- PRINT LABELS --
430 CLS
440 LET C$(4)="A FATHER  8"
450 LET S(4)=20
460 FOR X=1 TO 14 STEP 4
470 LET Q=INT (X/4)+1
480 GOSUB Q*1000
490 PRINT AT X,0;V$(6 TO )
500 PRINT C$(Q,1 TO VAL C$(Q,11 TO 12))
510 NEXT X
519 REM -- DRAW GRAPHICS --
520 FOR X=1 TO 13 STEP 4
530 LET Q=INT (X/4)+1
540 FOR C=11 TO 11+S(Q)
550 FOR R=X TO X+1
560 PRINT AT R,C;CHR$ 8
570 NEXT R
580 NEXT C
590 NEXT X
600 PRINT AT 17,4;"HAPPY FATHERS DAY"
610 PRINT AT 19,25-LEN N$;"LOVE, ";N$
620 LET R$=INKEY$
630 IF R$="" THEN 620
640 STOP
1000 LET T$="SPORT"
1010 LET V$="LIKE PLAYING"
1020 RETURN
2000 LET T$="CHORE"
2010 LET V$="HATE DOING"
2020 RETURN
3000 LET T$="GAME"
3010 LET V$="LIKE PLAYING"
3020 RETURN
4000 LET V$="NULL BEING"
4010 RETURN
```

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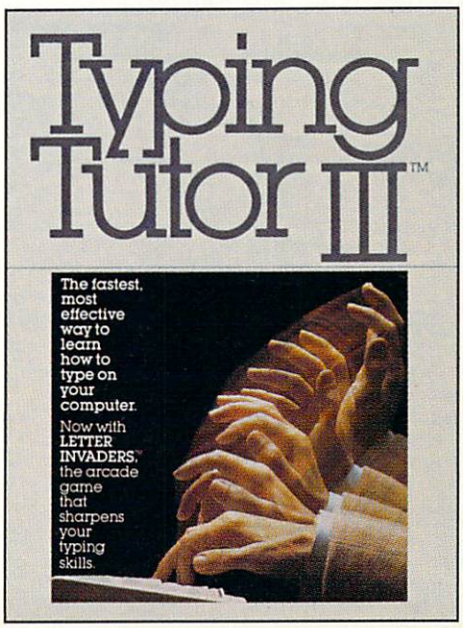
SIMON & SCHUSTER



Timex Sinclair 2068/*Father's Day Card*

```
10 DIM C$(4,12)
20 DIM S(4)
30 CLS
40 PRINT "FATHER'S DAY CARD"
50 PRINT
60 PRINT "PLEASE PRESS <ENTER> AFTER EACH REPLY."
70 PRINT
80 PRINT "WHAT IS YOUR FIRST NAME?"
90 INPUT N$
100 PRINT
110 PRINT "TELL ME, ";N$;" ..."
119 REM -- START INPUT LOOP --
120 FOR X=1 TO 3
130 READ T$,V$
140 IF X>1 THEN CLS
150 PRINT "WHAT ";T$;" DOES YOUR FATHER"
160 PRINT V$;"?"
170 PRINT
180 PRINT "(10 LETTERS OR FEWER, PLEASE.)"
190 PRINT
200 PRINT "HE ";V$(1 TO 4);"S ";V$(6 TO );
210 INPUT F$
220 IF LEN F$>10 THEN GO TO 170
230 LET C$(X)=F$
240 LET C$(X,11 TO 12)=STR$ LEN F$
249 REM -- RATE DAD --
250 CLS
260 PRINT "ON A SCALE OF 1 TO 10,"
270 PRINT "HOW GOOD IS YOUR DAD AT"
280 PRINT V$(6 TO );" ";C$(X,1 TO VAL C$(X,11 TO 12));
"?"
290 INPUT S(X)
300 IF S(X)<1 OR S(X)>10 THEN GO TO 250
310 NEXT X
319 REM -- END OF INPUT LOOP --
320 CLS
330 PRINT "PRESS <ENTER>, THEN GET YOUR","DAD."
340 LET R$=INKEY$
350 IF R$<>CHR$ 13 THEN GO TO 340
360 CLS
370 PRINT "HI DAD!"
380 PRINT "PRESS <ENTER> TO SEE"
390 PRINT "HOW GOOD YOU ARE AT ..."
400 LET R$=INKEY$
410 IF R$<>CHR$ 13 THEN GO TO 400
419 REM -- PRINT LABELS --
420 CLS
430 RESTORE
440 LET C$(4)="A FATHER  8"
450 LET S(4)=20
460 FOR X=1 TO 13 STEP 4
470 LET Q=INT(X/4)+1
480 READ T$,V$
490 PRINT AT X,0;V$(6 TO )
500 PRINT C$(Q, TO VAL C$(Q,11 TO 12))
510 NEXT X
519 REM -- DRAW GRAPHICS --
520 FOR X=1 TO 13 STEP 4
530 LET Q=INT (X/4)+1
540 FOR C=11 TO 11+S(Q)
550 FOR R=X TO X+1
560 PRINT AT R,C;CHR$ 8
570 NEXT R
580 NEXT C
590 NEXT X
600 PRINT AT 17,4;"HAPPY FATHER'S DAY"
610 PRINT AT 19,25-LEN N$;"LOVE, ";N$
620 LET R$=INKEY$
630 IF R$="" THEN 620
640 STOP
1000 LET T$="SPORT"
1010 LET V$="LIKE PLAYING"
1020 RETURN
2000 LET T$="CHORE"
2010 LET V$="HATE DOING"
2020 RETURN
3000 LET T$="GAME"
3010 LET V$="LIKE PLAYING"
3020 RETURN
4000 LET V$="NULL BEING"
4010 RETURN
```

TRS-80 Color Computer/*Father's Day Card*

```
10 CLS
20 PRINT "FATHER'S DAY CARD"
30 PRINT
40 PRINT "PLEASE PRESS <ENTER> AFTER EACH REPLY."
50 PRINT
60 INPUT "WHAT IS YOUR FIRST NAME";N$
70 PRINT
80 PRINT "TELL ME, ";N$" ..."
89 REM -- START INPUT LOOP --
90 FOR X=1 TO 3
100 READ T$,V$
110 IF X>1 THEN CLS
120 PRINT "WHAT ";T$;" DOES YOUR FATHER"
130 PRINT V$;"?"
140 PRINT
150 PRINT "(9 LETTERS OR FEWER, PLEASE.)"
160 PRINT
170 PRINT "HE ";LEFT$(V$,4);"S ";RIGHT$(V$,LEN(V$)-5);
180 INPUT C$(X)
190 IF LEN(C$(X))>9 THEN 140
199 REM -- RATE DAD --
200 CLS
210 PRINT "ON A SCALE OF 1 TO 10,"
220 PRINT "HOW GOOD IS YOUR DAD"
230 PRINT "AT ";RIGHT$(V$,LEN(V$)-5);" ";C$(X);
240 INPUT S(X)
250 IF S(X)<1 OR S(X)>10 THEN 200
260 NEXT X
269 REM -- END OF INPUT LOOP --
270 CLS
280 PRINT "PRESS <ENTER>, THEN"
290 PRINT "GET YOUR DAD."
300 R$=INKEY$
310 IF R$<>CHR$(13) THEN 300
320 CLS
330 PRINT "HI DAD!"
340 PRINT "PRESS <ENTER> TO SEE HOW GOOD"
350 PRINT "YOU ARE AT ..."
360 R$=INKEY$
370 IF R$<>CHR$(13) THEN 360
379 REM -- PRINT LABELS --
380 CLS
390 RESTORE
400 C$(4)="A FATHER"
410 S(4)=12
420 FOR X=1 TO 4
430 READ T$,V$
440 PRINT RIGHT$(V$,LEN(V$)-5)
450 PRINT C$(X)
460 PRINT
470 NEXT X
479 REM -- DRAW GRAPHICS --
480 FOR X=0 TO 9 STEP 3
490 Q=X/3+1
500 FOR CO=9 TO S(Q)*2+7
510 FOR RO=X TO X+1
520 PRINT@RO*32+CO,CHR$(143+Q*16);
530 NEXT RO
540 NEXT CO
550 NEXT X
560 PRINT
570 PRINT TAB(6);"HAPPY FATHER'S DAY!"
580 PRINT
590 PRINT TAB(32-LEN(N$)-7);"LOVE, ";N$
600 R$=INKEY$
```

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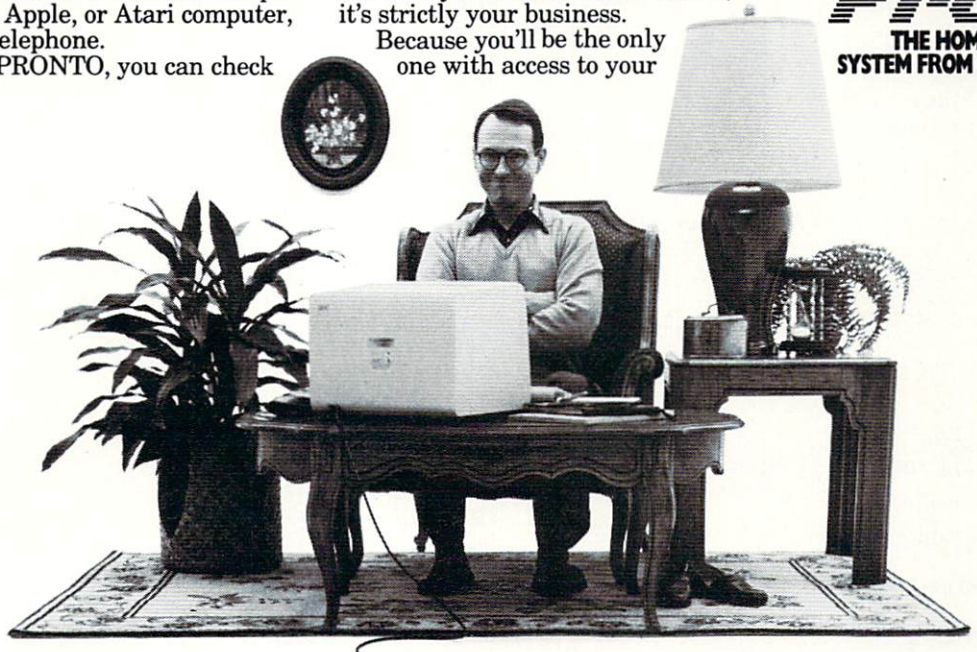

```
610 IF R$="" THEN 600
620 END
1000 DATA SPORT,LIKE PLAYING
1010 DATA CHORE,HATE DOING
1020 DATA GAME,LIKE PLAYING
1030 DATA NULL,NULL BEING
```

TRS-80 Model III/*Father's Day Card*

```
10 CLS
20 PRINT "FATHER'S DAY CARD"
30 PRINT
40 PRINT "PLEASE PRESS <ENTER> AFTER EACH REPLY."
50 PRINT
60 INPUT "WHAT IS YOUR FIRST NAME";N$
70 PRINT
80 PRINT "TELL ME, ";N$;" ..."
89 REM -- START INPUT LOOP --
90 FOR X=1 TO 3
100 READ T$,V$
110 IF X>1 THEN CLS
120 PRINT "WHAT ";T$;" DOES YOUR FATHER ";V$;"?"
130 PRINT
140 PRINT "(12 LETTERS OR FEWER, PLEASE.)"
150 PRINT
160 PRINT "HE ";LEFT$(V$,4);"S ";RIGHT$(V$,LEN(V$)-5);
170 INPUT C$(X)
180 IF LEN(C$(X))>12 THEN 130
189 REM -- RATE DAD --
190 CLS
200 PRINT "ON A SCALE OF 1 TO 10,"
210 PRINT "HOW GOOD IS YOUR DAD AT ";RIGHT$(V$,LEN(V$)
-5);" ";C$(X);
220 INPUT S(X)
230 IF S(X)<1 OR S(X)>10 THEN 190
240 NEXT X
249 REM -- END OF INPUT LOOP --
250 CLS
260 PRINT "PRESS <ENTER>, THEN GET YOUR DAD."
270 R$=INKEY$
280 IF R$<>CHR$(13) THEN 270
290 CLS
300 PRINT "HI DAD!"
310 PRINT "PRESS <ENTER> TO SEE HOW GOOD YOU ARE AT ..
."
320 R$=INKEY$
330 IF R$<>CHR$(13) THEN 320
339 REM -- PRINT LABELS --
340 CLS
350 PRINT@768,"PLAYING";@784,"DOING";@800,"PLAYING";@8
16,"BEING"
360 PRINT@832,C$(1);@848,C$(2);@864,C$(3);@880,"A FATH
ER";
369 REM -- DRAW GRAPHICS --
370 S(4)=12
380 FOR X=0 TO 48 STEP 16
390 FOR RO=11 TO 12-S((X/16)+1) STEP -1
400 FOR CO=X TO X+12
410 PRINT@CO+64*RO,CHR$(191);
420 NEXT CO
430 NEXT RO
440 NEXT X
450 PRINT@911,"HAPPY FATHER'S DAY!"
460 PRINT@1000-LEN(N$),"LOVE, ";N$;
470 R$=INKEY$
480 IF R$="" THEN 470
490 END
1000 DATA SPORT,LIKE PLAYING
1010 DATA CHORE,HATE DOING
1020 DATA GAME,LIKE PLAYING
```

VIC-20/*Father's Day Card*

```
10 PRINT CHR$(147);"FATHER'S DAY CARD"
20 PRINT
30 PRINT "PLEASE PRESS <RETURN>"
40 PRINT "AFTER EACH REPLY."
50 PRINT
60 PRINT "WHAT IS YOUR NAME?"
70 INPUT N$
80 PRINT
90 PRINT "TELL ME, ";N$;" ..."
99 REM -- START INPUT LOOP --
100 FOR X=1 TO 3
110 READ T$,V$
120 IF X>1 THEN PRINT CHR$(147);
130 PRINT "WHAT ";T$
140 PRINT "DOES YOUR FATHER"
150 PRINT V$;"?"
160 PRINT
170 PRINT "(9 LETTERS OR FEWER,"
180 PRINT "PLEASE.)"
190 PRINT
200 PRINT "HE ";LEFT$(V$,4);"S ";RIGHT$(V$,LEN(V$)-5);
210 INPUT C$(X)
220 IF LEN(C$(X))>9 THEN 160
229 REM -- RATE DAD --
230 PRINT CHR$(147);"ON A SCALE OF 1 TO 10,"
240 PRINT "HOW GOOD IS YOUR DAD"
250 PRINT "AT ";RIGHT$(V$,LEN(V$)-5);" ";C$(X);"?"
260 INPUT S(X)
270 IF S(X)<1 OR S(X)>10 THEN 230
280 NEXT X
289 REM -- END OF INPUT LOOP --
290 PRINT CHR$(147);"PRESS <RETURN>, THEN"
300 PRINT "GET YOUR DAD."
310 GET R$
320 IF R$<>CHR$(13) THEN 310
330 PRINT CHR$(147);"HI DAD!"
340 PRINT "PRESS <RETURN> TO SEE"
350 PRINT "HOW GOOD YOU"
360 PRINT "ARE AT ..."
370 GET R$
380 IF R$<>CHR$(13) THEN 370
389 REM -- PRINT LABELS --
390 PRINT CHR$(147)
400 POKE 36879,8
410 C$(4)="A FATHER"
420 S(4)=12
430 RESTORE
440 FOR X=1 TO 4
450 READ T$,V$
460 PRINT RIGHT$(V$,LEN(V$)-5)
470 PRINT C$(X)
480 PRINT
490 PRINT
500 NEXT X
509 REM -- DRAW GRAPHICS --
510 FOR X=1 TO 13 STEP 4
520 FOR CO=9 TO S(INT(X/4)+1)+9
530 FOR RO=X TO X+1
540 QP=CO+22*RO
550 POKE 38400+QP,7-INT(X/4)
560 POKE 7680+QP,160
570 NEXT RO
580 NEXT CO
590 NEXT X
600 PRINT
610 PRINT CHR$(158);TAB(3);"HAPPY FATHER'S DAY!"
620 PRINT
630 PRINT TAB(15-LEN(N$));"LOVE, ";N$
640 GET R$
650 IF R$="" THEN 640
660 END
1000 DATA SPORT,LIKE PLAYING
1010 DATA CHORE,HATE DOING
1020 DATA GAME,LIKE PLAYING
1030 DATA NULL,NULL BEING
```

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Poster, Secret Filer and Double Feature Mystery/Adventure designed and developed by Information Technology Design Associates. Turtle Tracks designed and developed by Thomas R. Smith. Square Pairs designed and developed by Glenn M. Kleiman, Teaching Tools: Software, Inc.

RECIPE FOR DISASTER: 3 tbsp. of Trickery, 1 pt. of Paranoia, and a Dash of Danger

BY PETER FAVARO

As an expert chef, you could hardly contain your joy the day the news arrived that you had finally been accepted into La Societé d'Avancement Gastronomique, which is composed of a handful of the world's greatest chefs.

Once a year the chefs meet and try to outdo each other with their most favored and enticing recipe. The stakes are high: The winner of the competition becomes known as the world's greatest cook, and customer attendance at his or her restaurant doubles overnight.

The atmosphere during the competition is tense. Although the five chefs freely exchange trade secrets throughout the rest of the year, during the competition they take a solemn vow not to discuss the proceedings at hand, so that they won't accidentally reveal their recipes before the final judging. They even take separate lodgings.

Precaution against their own carelessness is not the chefs' only concern. In recent years all have fallen victim to suspicious misfortunes, suggesting that none is above using foul play to cast a more favorable light on his or her creation. Why, just last year, a generous amount of chili powder was discovered in Chef Etienne's chocolate éclairs. Someone also had cleverly substituted wallpaper paste in Chef Giorgio's spaghetti sauce. The American chef, Scarlet, found her Southern fried drumsticks burned to a crisp, and evidence that the stove's wiring had been tampered with. When Chef Wilhelm pulled his sausages out of the oven, he discovered, to his horror, that each link had been stuffed with sawdust. And Chef Mayling's sweet-and-sour sea bass tasted suspiciously like ordinary tuna fish, which it never did when she served it to her customers in China.

This year, La Societé d'Avancement Gastronomique will meet at a cooking school in the south of France. On a beautiful June day, you arrive at the designated coastal town feeling excited and honored. As a newcomer to the society, you are impervious to the mood of espionage and foul play that already permeates the air, and naively leave your recipe box in plain view of all the assembled chefs. Your innocence is quickly shattered when, two hours later, you discover that its contents have been pilfered.

You haven't the faintest idea whom to suspect. Direct assistance from any one of the chefs is out of the question. No one will risk expulsion from the society by breaking the vow of silence and discussing the competition. But nothing can stop some of the chefs from indirectly identifying the thief; their suggestions may contain hidden clues.

PETER FAVARO, PH.D., *is an education and recreation video-game design consultant, and a fourth-generation chef of the puzzle's stolen recipe, which originated in Palermo, Italy, on his great-great grandmother's table. He is currently writing a book on educational computing for Prentice-Hall, and is the author of last month's puzzle.*

HOW TO PLAY

Set your computer to all uppercase letters and turn the volume up before running the program. You must first register your name at the hotel where you will be staying. Then select the chef you wish to speak to, and use your computer as a telephone. Dial "0" for operator assistance. It's a small town, so the operator knows where every chef is staying and will immediately connect you. If you get a busy signal, be patient. The chefs may be talking to friends and family back home, since the restriction on conversation during the competition makes it a lonely stay. Wait a few seconds, then redial.

Speak to all five chefs before attempting to guess. It is best to jot down each chef's telephone number on a piece of paper, along with the name of the chef who gave it to you. Wrong numbers can easily be remedied by asking the operator to connect you to the party in question.

When you think you know who stole your recipe, type "G" for guess. You will then be asked to supply the suspected chef's name. Random guessing is almost useless. Wrong guesses "disconnect" you from the puzzle, at which point you'll have to begin again. Since no chef is above suspicion, each time you begin, the culprit will change. If you're clever, and guess correctly the first time, you can retrieve your recipe in time for the final judging. If you guess incorrectly, you can get an additional clue by typing "H" for help. If all else fails, turn the computer off and go out to dinner. The solution will appear in next month's issue.

Base Version (TRS-80 Model III)/*Recipe for Disaster*

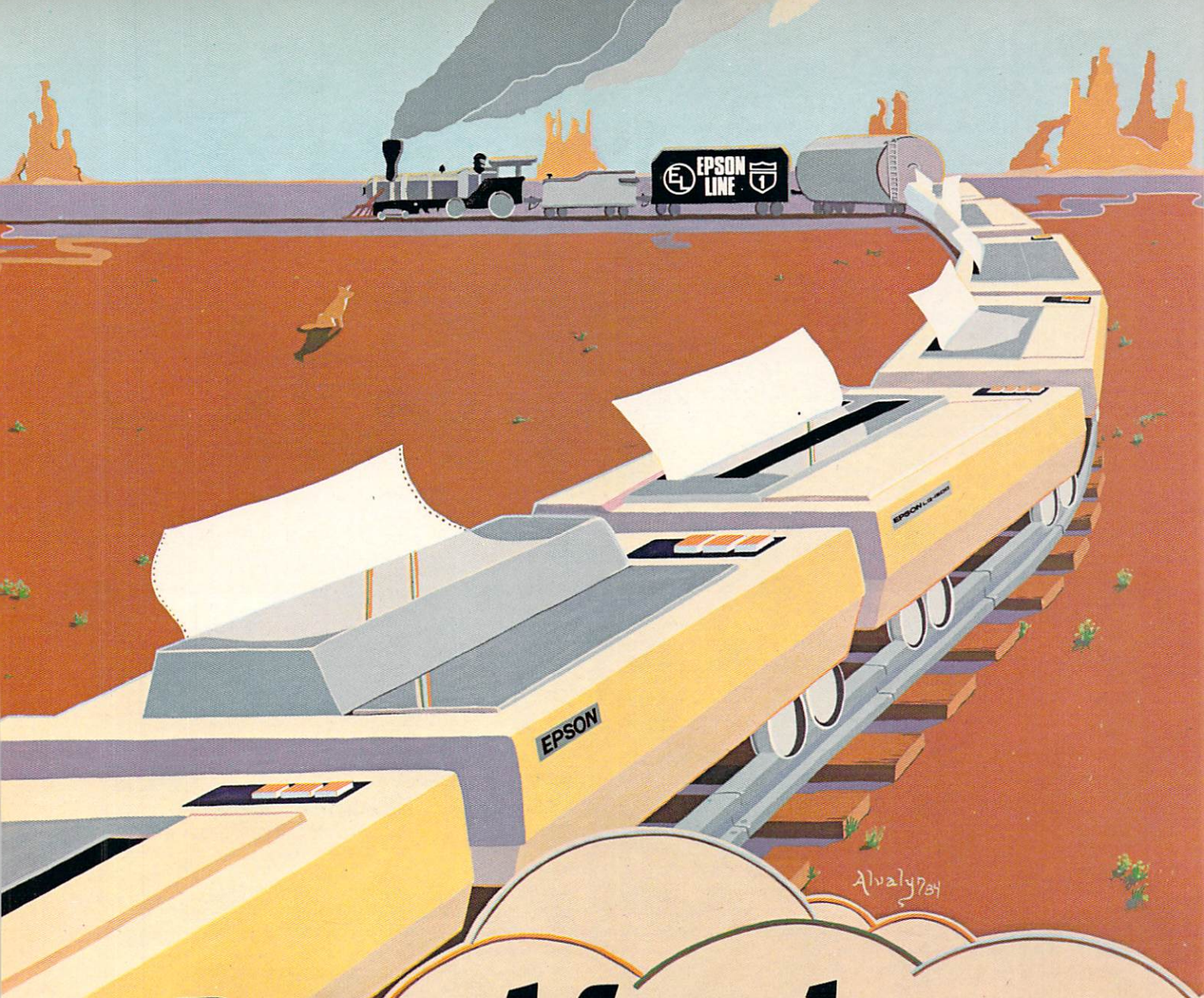
```
10 CLEAR 1000:DIM CH$(5),GL$(5),CN$(5),HL$(5),RC$(21),
PNT(5),CK(2,41)
20 WL=64:LT=0:T=1:W=0:DC=0:GUESS=0
30 FOR I=1 TO 41:READ CK(1,I),CK(2,I):NEXT I
50 CLS:R$="RECIPE FOR DISASTER":GOSUB 1000
60 PRINT:R$="MIXING INGREDIENTS":GOSUB 1000
70 FOR X=1 TO 5:GOSUB 2000:CH$(X)=T$:T=0:GOSUB 2000:GL
$(X)=T$
80 GOSUB 2000:CN$(X)=T$:T=1:GOSUB 2000:HL$(X)=T$:NEXT
X:GOSUB 2000:HP$=T$
90 FOR X=1 TO 20:GOSUB 2000:RC$(X)=T$:NEXT X
100 CLS:R$="PLEASE REGISTER AT HOTEL DESK.":GOSUB 1000
:PRINT
110 INPUT "YOUR NAME, PLEASE";N$:IF N$="" THEN 110
120 N$="CHEF "+N$
130 FOR X=1 TO 5:PNT(X)=0:NEXT X
140 FOR X=1 TO 5
150 T=X+RND(4):T=T+5*(T>5):IF PNT(T)>0 THEN 150
160 IF X=4 AND PNT(5)=0 THEN PNT(5)=X ELSE PNT(T)=X
170 NEXT X
180 TH=RND(5):IF TH=LT THEN 180
190 BD=RND(5):IF BD=TH THEN 190
200 LT=TH
210 R$="DIAL A NUMBER, OR '0' FOR OPERATOR, OR ENTER '
G' TO GUESS"
220 IF GUESS=1 THEN R$=R$+", OR 'H' FOR HELP"
```

ILLUSTRATION BY JOSH GOSFIELD

```
230 R$=R$+".":GOSUB 3000:PRINT
240 INPUT D$:IF D$="" THEN 240
250 IF D$="0" OR D$="O" THEN 500
260 IF D$="H" AND GUESS=1 THEN R$=HP$:GOSUB 3000:GOSUB
 4000:GOTO 210
270 IF D$="G" THEN 560
280 P$="":FOR X=1 TO LEN(D$):A=ASC(MID$(D$,X,1))
290 IF A>47 AND A<58 THEN P$=P$+CHR$(A)
300 NEXT X
310 FL=0:FOR X=1 TO 5:IF P$=CN$(X) THEN FL=X
320 IF P$=GL$(TH) THEN FL=99
330 NEXT X
340 IF FL>0 THEN 370
350 R$="THE NUMBER YOU HAVE REACHED IS NOT IN SERVICE.
":GOSUB 3000
360 GOSUB 4000:GOTO 210
370 IF RND(0)>.15 THEN 400
380 FOR I=1 TO 5:CLS:FOR D=1 TO 200:NEXT D:R$="BUSY!":
GOSUB 1000
390 FOR D=1 TO 200:NEXT D:NEXT I:GOTO 210
400 CLS:FOR I=1 TO 5:PRINT@WL/2-7,"R-R-R-I-N-N-G!"
410 FOR D=1 TO 100:NEXT D:CLS:FOR D=1 TO 100:NEXT D:NE
XT I
420 IF FL<>99 THEN 460
430 R$="BONJOUR, "+N$+". I'M SORRY, YOU MUST "
440 R$=R$+"HAVE THE WRONG NUMBER. CALL THE OPERATOR FO
R ASSISTANCE.":GOSUB 3000
450 GOSUB 4000:GOTO 210
460 R$=HL$(FL)+", "+N$+", THIS IS CHEF "+CH$(FL)+".":G
OSUB 3000
470 PRINT:R$="I CAN'T DISCUSS YOUR STOLEN RECIPE, BUT
TRY CHEF "+CH$(PNT(FL))
480 R$=R$+" AT ":Z$=CN$(PNT(FL)):IF FL<>BD AND FL<>TH
THEN Z$=GL$(TH)
490 R$=R$+LEFT$(Z$,3)+"-"+RIGHT$(Z$,4)+".":GOSUB 3010:
GOSUB 4000:GOTO 210
500 R$="BONJOUR, THIS IS THE OPERATOR."
510 R$=R$+" TO WHOM DO YOU WISH TO SPEAK?":GOSUB 3000:
PRINT
520 INPUT "CHEF";Z$:IF Z$="" THEN 520
530 FL=0:FOR X=1 TO 5:IF CH$(X)=Z$ THEN FL=X
540 NEXT X:PRINT:IF FL=0 THEN T$=Z$:GOTO 610
550 GOTO 370
560 R$="WHAT IS THE NAME OF THE CHEF WHO STOLE YOUR RE
CIPE?"
570 GOSUB 3000:PRINT:INPUT T$:IF T$="" THEN 560
580 IF T$=CH$(TH) THEN 660
590 FL=0:FOR X=1 TO 5:IF T$=CH$(X) THEN FL=1:GUESS=1
600 NEXT X:IF FL=1 THEN 630
610 R$="SORRY, "+N$+", THERE IS NO CHEF BY THE NAME OF
 "+T$
620 R$=R$+" AT THE COMPETITION.":GOSUB 3000:GOSUB 4000
:GOTO 210
630 R$="SORRY, CHEF "+T$+" WAS TOO BUSY IN THE KITCHEN
 TO STEAL YOUR "
640 R$=R$+"RECIPE. YOU MUST BEGIN A NEW GAME.":GOSUB 3
000
650 PRINT:R$="(REMEMBER: THE THIEF WILL CHANGE.)":GOSU
B 1000:GOSUB 4000:GOTO 130
660 R$="CONGRATULATIONS! YOU'VE FOUND THE THIEF, WHO U
NHAPPILY RETURNS YOUR "
670 R$=R$+"RECIPE.":GOSUB 3000:GOSUB 4000:R$="HERE IS
YOUR STOLEN RECIPE!"
680 GOSUB 3000:FOR X=1 TO 10:R$=RC$(X):GOSUB 3010:NEXT
 X
690 GOSUB 4000:GOSUB 3000:CLS:FOR X=11 TO 20:R$=RC$(X)
:GOSUB 3010:NEXT X
700 GOTO 700
1000 PRINT TAB((WL-LEN(R$))/2);R$:RETURN
2000 T$="":READ R$:CS=0:DC=DC+1:FOR Y=1 TO LEN(R$):C=A
SC(MID$(R$,Y,1))
2010 Z=C+1+(W*T*2):CS=CS+C:IF C=63 THEN Z=32
2020 IF C=35 THEN Z=90
2030 IF C=36 THEN Z=44
2040 T$=T$+CHR$(Z):W=NOT W:NEXT Y
2050 IF CK(2,DC)=CS THEN RETURN
2060 PRINT "DATA ERROR IN LINE #";INT(DC/6)*10+5000
2070 PRINT "OR IN LINE #";CK(1,DC)*10+6000:END
3000 CLS
3010 IF LEN(R$)<=WL THEN PRINT R$:RETURN
3020 FOR I=1 TO WL-1:IF MID$(R$,I,1)=" " THEN L=I-1
3030 NEXT I:PRINT LEFT$(R$,L):R$=RIGHT$(R$,LEN(R$)-L-1
):GOTO 3010
4000 PRINT:PRINT:PRINT:R$="PRESS ANY KEY TO CONTINUE."
:GOSUB 1000
4010 T$=INKEY$:IF T$="" THEN 4010 ELSE RETURN
5000 DATA 0,529,0,365,0,356,0,672,1,527,1,364
5010 DATA 1,365,1,833,2,528,2,365,2,373,2,230
5020 DATA 3,525,3,363,3,357,3,609,4,519,4,362
5030 DATA 4,369,4,544,5,4608,6,766,6,63,6,886
5040 DATA 6,63,6,1219,6,408,6,874,7,1603,7,1612
5050 DATA 7,1106,7,63,8,756,8,420,8,63,9,4237
5060 DATA 10,1824,10,2750,11,3644,12,1937,13,4591
6000 DATA VJKIDML,8343245,1124714,HTUDO?U@H
6010 DATA FJNSFJN,3356335,1455626,CTPM?FJNSMP
6020 DATA LBXMHOF,5184353,7135768,XDJ
6030 DATA RD@SKFS,6116427,7551120,IH?SIDBG(
6040 DATA DUHFMOD,2732552,4152768,CNOIPTS
6050 DATA VSNOF?MVLCDSR?LBX?MPS?AF?TN?VSNOF/?TSVCZ?B?S
DBK?SFKFOINOD?CJ@M-
6060 DATA SHDD?ABKMR/,?,JMHQFCJDOST9,?,001!KC-?BPNLDE?
SHDD,3?FFHR,CQF@E?DQVLCR
6070 DATA 2.9?DTQ?Q@SLFRBM?BIDFRF,001!KC-!LP##@SDMKB?D
GFDTD?,RBKU?BME?QDQOFQ,?
6080 DATA CJQFBUHPMT,)+)+)+)+)+,?
6090 DATA XGJKF?SHDD?HT?INU$?@EC?LP##@SDMKB$??FFHR$?BM
E?Q@SLFRBM?BIDFRF-
6100 DATA T@MS?@OC?OFOQDS?UN?SBRUD/,KFS?BPNM?JM?QFESHH
DS@UNS?2.3?UN?O?GPTS-
6110 DATA XGFM?RUHDJZ$?RI@QD?HOSP?C@MKT?3?JMDGFR?HO?EH
BLFSFQ/
6120 DATA QPKM?C@MKT?JM?ASDBC?BSTNAT-
6130 DATA EDFO?ESX?EPQ?SIQFD?LJMVSFR?TOSJK?NVSTHED?HT?
CQPVO?BME?DQVMDGZ-
```

Atari/*Recipe For Disaster*

```
10 DIM CH$(35),GL$(35),CN$(35),HL$(45),HLP(6),RC$(420)
,RCP(21),R$(200),N$(40),PNT(5),HP$(70),CL$(1),T$(80)
20 DIM D$(20),Z$(20),P$(20),CK(2,41):CL$=CHR$(125):WL=
40:LT=0:T=1:W=0:DC=0
30 POKE 752,1:POKE 82,0:FOR X=1 TO 41:READ Y,Z:CK(1,X)
=Y:CK(2,X)=Z:NEXT X
40 PRINT CL$;:R$="RECIPE FOR DISASTER":GOSUB 1000
50 PRINT :R$="MIXING INGREDIENTS":GOSUB 1000
60 FOR X=1 TO 5:A=X*7-6:GOSUB 2000:CH$(A)=T$:T=0:GOSUB
 2000:GL$(A)=T$:GOSUB 2000:CN$(A)=T$:T=1:GOSUB 2000
70 A=LEN(HL$)+1:HL$(A)=T$:HLP(X)=A:NEXT X:HLP(6)=LEN(H
L$)+1:GOSUB 2000:HP$=T$
80 FOR X=1 TO 20:GOSUB 2000:A=LEN(RC$)+1:RC$(A)=T$:RCP
(X)=A:NEXT X:RCP(21)=LEN(RC$)+1
90 PRINT CL$;:R$="PLEASE REGISTER AT HOTEL DESK.":GOSU
B 1000:PRINT
100 PRINT "YOUR NAME, PLEASE";:INPUT R$:IF R$="" THEN
100
110 N$="CHEF ":N$(6)=R$
120 FOR X=1 TO 5:PNT(X)=0:NEXT X
130 FOR X=1 TO 5
140 T=X+INT(RND(0)*4)+1:T=T-5*(T>5):IF PNT(T)>0 THEN 1
40
150 IF X=4 AND PNT(5)=0 THEN PNT(5)=X:NEXT X
160 PNT(T)=X:NEXT X
170 TH=INT(RND(0)*5)+1:IF TH=LT THEN 170
180 BD=INT(RND(0)*5)+1:IF BD=TH THEN 180
190 LT=TH
200 R$="DIAL A NUMBER, OR '0' FOR OPERATOR, OR ENTER '
G' TO GUESS"
210 IF GUESS=1 THEN R$(LEN(R$)+1)=", OR 'H' FOR HELP"
220 R$(LEN(R$)+1)=".":GOSUB 3000:PRINT
230 INPUT D$:IF D$="" THEN 230
240 IF D$="0" OR D$="O" THEN 490
250 IF D$="H" AND GUESS=1 THEN R$=HP$:GOSUB 3000:GOSUB
 4000:GOTO 200
260 IF D$="G" THEN 550
```



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```
270 P$="":FOR X=1 TO LEN(D$):A=ASC(D$(X))
280 IF A>47 AND A<58 THEN P$(LEN(P$)+1)=CHR$(A)
290 NEXT X
300 FL=0:FOR X=1 TO 5:IF P$=CN$(X*7-6,X*7) THEN FL=X
310 IF P$=GL$(X*7-6,X*7) THEN FL=99
320 NEXT X
330 IF FL>0 THEN 360
340 R$="THE NUMBER YOU HAVE REACHED IS NOT IN SERVICE.
":GOSUB 3000
350 GOSUB 4000:GOTO 200
360 IF RND(0)>0.15 THEN 390
370 FOR X=1 TO 5:FOR Y=1 TO 2:SOUND 0,60,12,12:SOUND 1
,61,10,15:FOR D=1 TO 17:NEXT D
380 SOUND 0,0,0,0:SOUND 1,0,0,0:FOR D=1 TO 45:NEXT D:N
EXT Y:NEXT X:GOTO 200
390 FOR X=1 TO 3:FOR Y=1 TO 30:SOUND 1,200,10,5:SOUND
1,40,10,15:SOUND 0,20,10,15:SOUND 2,23,10,15
400 SOUND 0,0,0,0:SOUND 1,0,0,0:SOUND 2,0,0,0:NEXT Y:F
OR D=1 TO 200:NEXT D:NEXT X:SOUND 0,90,8,15:FOR D=1 TO
 10:NEXT D:SOUND 0,0,0,0
410 IF FL<>99 THEN 440
420 R$="BONJOUR, ":R$(10)=N$:R$(LEN(R$)+1)=". I'M SORR
Y. YOU MUST HAVE THE WRONG NUMBER. CALL THE "
430 R$(LEN(R$)+1)="OPERATOR FOR ASSISTANCE.":GOSUB 300
0:GOSUB 4000:GOTO 200
440 R$=HL$(HLP(FL),HLP(FL+1)-1):R$(LEN(R$)+1)=", ":R$(
LEN(R$)+1)=N$:R$(LEN(R$)+1)=", "
450 R$(LEN(R$)+1)="THIS IS CHEF ":R$(LEN(R$)+1)=CH$(FL
*7-6,FL*7):R$(LEN(R$)+1)=".":GOSUB 3000
460 PRINT :R$="I CAN'T DISCUSS YOUR STOLEN RECIPE, BUT
 TRY CHEF ":R$(LEN(R$)+1)=CH$(PNT(FL)*7-6,PNT(FL)*7)
470 R$(LEN(R$)+1)=" AT ":Z$=CN$(PNT(FL)*7-6,PNT(FL)*7)
:IF FL<>BD AND FL<>TH THEN Z$=GL$(TH*7-6,TH*7)
480 R$(LEN(R$)+1)=Z$(1,3):R$(LEN(R$)+1)="-":R$(LEN(R$)
+1)=Z$(4,7):R$(LEN(R$)+1)=".":GOSUB 3010:GOSUB 4000:GO
TO 200
490 R$="BONJOUR, THIS IS THE OPERATOR. TO WHOM DO YOU
WISH TO SPEAK?"
500 GOSUB 3000:PRINT
510 PRINT "CHEF ";:INPUT Z$:IF Z$="" THEN 510
520 FL=0:FOR X=1 TO 5:IF CH$(X*7-6,X*7)=Z$ THEN FL=X
530 NEXT X:PRINT :IF FL=0 THEN T$=Z$:GOTO 600
540 GOTO 360
550 R$="WHAT IS THE NAME OF THE CHEF WHO STOLE YOUR RE
CIPE?"
560 GOSUB 3000:PRINT :INPUT T$:IF T$="" THEN 550
570 IF T$=CH$(TH*7-6,TH*7) THEN 650
580 FL=0:FOR X=1 TO 5:IF T$=CH$(X*7-6,X*7) THEN FL=1:G
UESS=1
590 NEXT X:IF FL=1 THEN 620
600 R$="SORRY, ":R$(LEN(R$)+1)=N$:R$(LEN(R$)+1)=", THE
RE IS NO CHEF BY THE NAME OF ":R$(LEN(R$)+1)=T$
610 R$(LEN(R$)+1)=" AT THE COMPETITION.":GOSUB 3000:GO
SUB 4000:GOTO 200
620 R$="SORRY, CHEF ":R$(LEN(R$)+1)=T$:R$(LEN(R$)+1)="
 WAS TOO BUSY IN THE KITCHEN TO STEAL YOUR"
630 R$(LEN(R$)+1)=" RECIPE. YOU MUST BEGIN A NEW GAME.
":GOSUB 3000
640 PRINT :R$="(REMEMBER: THE THIEF WILL CHANGE.)":GOS
UB 1000:GOSUB 4000:GOTO 120
650 R$="CONGRATULATIONS! YOU'VE FOUND THE THIEF, WHO U
NHAPPILY RETURNS YOUR "
660 R$(LEN(R$)+1)="RECIPE.":GOSUB 3000:GOSUB 4000:R$="
HERE IS YOUR STOLEN RECIPE!"
670 GOSUB 3000:FOR X=1 TO 20:R$=RC$(RCP(X),RCP(X+1)-1)
:GOSUB 3010:NEXT X
680 GOTO 680
1000 T$="":FOR X=1 TO (WL-LEN(R$))/2:PRINT " ";:NEXT X
:PRINT R$:RETURN
2000 T$="":CS=0:DC=DC+1:READ R$:FOR Y=1 TO LEN(R$):C=A
SC(R$(Y)):Z=C+1-(W*T*2)
2010 CS=CS+C:IF C=63 THEN Z=32
2020 IF C=35 THEN Z=90
2030 IF C=36 THEN Z=44
2040 T$(Y,Y)=CHR$(Z):W= NOT W:NEXT Y
2050 IF CK(2,DC)<>CS THEN PRINT "DATA ERROR IN LINE #"
;INT(DC/6)*10+5000;" OR LINE #";CK(1,DC)*10+6000:END
2060 RETURN
3000 PRINT CL$;
3010 IF LEN(R$)<=WL THEN PRINT R$:RETURN
3020 FOR I=1 TO WL:IF R$(I,I)=" " THEN L=I-1
3030 NEXT I:PRINT R$(1,L):R$=R$(L+2):GOTO 3010
4000 POSITION 7,15:PRINT "PRESS ANY KEY TO CONTINUE."
4010 IF PEEK(764)=255 THEN 4010
4020 POKE 764,255:RETURN
5000 DATA 0,529,0,365,0,356,0,672,1,527,1,364
5010 DATA 1,365,1,833,2,528,2,365,2,373,2,230
5020 DATA 3,525,3,363,3,357,3,609,4,519,4,362
5030 DATA 4,369,4,544,5,4608,6,766,6,63,6,886
5040 DATA 6,63,6,1219,6,408,6,874,7,1603,7,1612
5050 DATA 7,1106,7,63,8,756,8,420,8,63,9,4237
5060 DATA 10,1824,10,2750,11,3644,12,1937,13,4591
6000 DATA VJKIDML,8343245,1124714,HTUDO?U@H
6010 DATA FJNSFJN,3356335,1455626,CTPM?FJNSMP
6020 DATA LBXMHOF,5184353,7135768,XDJ
6030 DATA RD@SKFS,6116427,7551120,IH?SIDBG(
6040 DATA DUHFMOD,2732552,4152768,CNOIPTS
6050 DATA VSNOF?MVLCDSR?LBX?MPS?AF?TN?VSNOF/?TSVCZ?B?S
DBK?SFKFOINOD?CJ@M-
6060 DATA SHDD?ABKMR/,?,JMHQFCJDOST9,?,001!KC-?BPNLDE?
SHDD,3?FFHR,CQF@E?DQVLCR
6070 DATA 2.9?DTQ?Q@SLFRBM?BIDFRF,001!KC-!LP##@SDMKB?D
GFDTD?,RBKU?BME?QDQOFQ,?
6080 DATA CJQFBUHPMT,)+)+)+)+)+,?
6090 DATA XGJKF?SHDD?HT?INU$?@EC?LP##@SDMKB$??FFHR$?BM
E?Q@SLFRBM?BIDFRF-
6100 DATA T@MS?@OC?OFOQDS?UN?SBRUD/,KFS?BPNM?JM?QFESHH
DS@UNS?2.3?UN?O?GPTS-
6110 DATA XGFM?RUHDJZ$?RI@QD?HOSP?C@MKT?3?JMDGFR?HO?EH
BLFSFQ/
6120 DATA QPKM?C@MKT?JM?ASDBC?BSTNAT-
6130 DATA EDFO?ESX?EPQ?SIQFD?LJMVSFR?TOSJK?NVSTHED?HT?
CQPVO?BME?DQVMDGZ-
```

MODIFICATIONS FOR OTHER COMPUTERS

ADAM/*Recipe for Disaster*

Use the base version with the following alterations: Omit `CLEAR 1000`: from the beginning of line 10. In line 20, change `WL=64` to `WL=31` . In lines 50, 690, and 3000, change `CLS` to `HOME` . In lines 180 and 190 change `RND(5)` to `INT(RND(1)*5)+1`. Finally, change lines 100, 110, 150–170, 370–410, 520, 530, 580, 650, 2010, 4010, and 7000 to read as follows:

```
100 r$="PLEASE REGISTER AT DESK.":GOSUB 3000:PRINT
110 INPUT "YOUR NAME, PLEASE? ";n$:IF n$="" THEN 110
150 t=x+INT(RND(1)*4)+1:t=t-5*(t>5):IF pnt(t)>0 THEN 1
50
160 IF x=4 AND pnt(5)=0 THEN pnt(5)=x:NEXT x
170 pnt(t)=x:NEXT x
370 IF RND(1)>.15 THEN 400
380 FOR i=1 TO 5:HOME:FOR d=1 TO 100:NEXT d:NEXT i
390 FOR d=1 TO 200:NEXT d:NEXT i:GOTO 210
400 HOME:FOR i=1 TO 5:HTAB 10:VTAB 1:PRINT "R-r-r-i-n-
n-g!"
410 FOR d=1 TO 100:NEXT d:HOME:FOR d=1 TO 100:NEXT d:N
EXT i
520 INPUT "CHEF ";z$:IF z$="" THEN 520
530 GOSUB 7000:fl=0:FOR x=1 TO 5:IF ch$(x)=z$ THEN fl=
x
580 z$=t$:GOSUB 7000:t$=z$:IF t$=ch$(th) THEN 660
650 PRINT:r$="(REMEMBER: THE THIEF WILL CHANGE.)":GOSU
B 3010:GOSUB 4000:GOTO 130
2010 z=c+1-w*t*2:cs=cs+c:IF c=63 THEN z=32
4010 GET t$:RETURN
7000 g$="":FOR x=1 TO LEN(z$):g$=g$+CHR$(ASC(MID$(z$,x
,1))-32*(MID$(z$,x,1)>"Z")):NEXT x:z$=g$:RETURN
```

Apple/*Recipe for Disaster*

Use the base version with the following alterations: Omit `CLEAR 1000`: from the beginning of line 10. In line 20, change `WL=64` to `WL=40` . In lines 50, 100, 690, and 3000, change `CLS` TO `HOME` . In lines 180 and 190, change `RND(5)` to `INT(RND(1)*5)+1`. Change lines 110, 150–170, 370, 520,

→

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2010, and 4010 to read as shown above for the ADAM version. Add lines 5070–5090:

```
5070 DATA 165,8,74,133,10,164,8,173,48,192
5080 DATA 136,234,234,208,251,165,7,56,229
5090 DATA 10,133,7,176,237,198,6,208,233,96
```

Finally, change lines 40 and 380–410 to read as follows:

```
40 FOR I=1 TO 29:READ A:POKE 767+I,A:NEXT I
380 FOR I=1 TO 5:POKE 6,70:POKE 8,254:CALL 768
390 FOR D=1 TO 500:NEXT D:NEXT I:GOTO 210
400 FOR I=1 TO 5:FOR Y=1 TO 30:POKE 6,3:POKE 8,200:CAL
L 768
410 FOR D=1 TO 10:NEXT D:NEXT Y:FOR D=1 TO 1000:NEXT D
:NEXT I
```

Commodore 64/*Recipe for Disaster*

Use the base version, with the following alterations: In lines 50, 100, 690, and 3000, change `CLS` to `PRINT CL$`. In lines 180 and 190, change `RND(5)` to `INT(RND(0)*5)+1`. Add lines 40 and 4020:

```
40 POKE SD+3,8:POKE SD+6,240:POKE SD+4,33:POKE SD+24,1
5
4020 RETURN
```

Finally, change lines 10, 20, 110, 150–170, 240, 380–410, 520, 570, and 4010 to read as follows:

```
10 DIM CH$(5),GL$(5),CN$(5),HL$(5),RC$(21),PNT(5),CK(2
,41):CL$=CHR$(147):WL=40
20 LT=0:T=1:W=0:DC=0:GUESS=0:SD=54272:FOR X=SD TO SD+2
4:POKE X,0:NEXT X
110 N$="":INPUT "YOUR NAME, PLEASE";N$:IF N$="" THEN 1
10
150 T=X+INT(RND(0)*4)+1:T=T+5*(T>5):IF PNT(T)>0 THEN 1
50
160 IF X=4 AND PNT(5)=0 THEN PNT(5)=X:NEXT X
170 PNT(T)=X:NEXT X
240 D$="":INPUT D$:IF D$="" THEN 240
380 FOR I=1 TO 5:POKE SD,20:POKE SD+1,22:FOR D=1 TO 13
0:NEXT D
390 POKE SD,0:POKE SD+1,0:FOR D=1 TO 100:NEXT D:NEXT I
:GOTO 210
400 FOR I=1 TO 5:FOR Y=1 TO 20:POKE SD+1,10
410 FOR D=1 TO 5:NEXT D:POKE SD+1,0:NEXT Y:FOR D=1 TO
800:NEXT D:NEXT I
520 Z$="":INPUT "CHEF";Z$:IF Z$="" THEN 520
570 GOSUB 3000:PRINT:T$="":INPUT T$:IF T$="" THEN 560
4010 GET T$:IF T$="" THEN 4010
```

IBM PC/*Recipe for Disaster*

Use the base version, with the following alterations: In line 10, change `CLEAR 1000` to `RANDOMIZE`. In line 20, change `WL=64` to `WL=80`. In lines 180 and 190, change `RND(5)` to `INT(RND*5)+1`. Omit line 390. Finally, change lines 150, 380, 400, and 410 to read as follows:

```
150 T=X+INT(RND*4)+1:T=T+5*(T>5):IF PNT(T)>0 THEN 150
380 FOR I=1 TO 5:SOUND 200,7:FOR D=1 TO 500:NEXT D:NEX
T I:GOTO 210
400 FOR I=1 TO 5:FOR Y=1 TO 20:SOUND 500,.5:SOUND 600,
.5:NEXT Y
410 FOR D=1 TO 1200:NEXT D:NEXT I
```

IBM PC*jr*/*Recipe for Disaster*

Make the changes indicated above for the IBM PC, except change `WL=64` to `WL=40` in line 20 (or, if you have 128K of RAM and a monitor capable of displaying 80 columns, instead add `WIDTH 80` : to the beginning of line 10).

TI-99/4A/*Recipe for Disaster*

Because the TI-99/4A does not allow more than one statement on a single numbered program line unless you have TI Extended BASIC, the regular TI BASIC version of *Recipe for Disaster* is much longer than the base version. If you would like a free translation of this program for the TI-99/4A without TI Extended BASIC, send a self-addressed, stamped envelope to Karen Cohen, "TI Recipe," FAMILY COMPUTING, 730 Broadway, New York, NY 10003.

TI-99/4A w/TI Extended BASIC/*Recipe for Disaster*

Use the base version, with the following alterations: First, use a double colon (::) instead of a single colon to separate multiple statements on a single numbered program line. So, for example, you would change line 30 to read

```
30 FOR I=1 TO 41 :: READ CK(1,I),CK(2,I) :: NEXT I
```

Second, change every plus sign (+) in lines 120, 220, 290, 430, 440, 460–490, 510, 610–630, 640, 670, and 2040 to an ampersand (&). Third, change `CLEAR 1000` to `RANDOMIZE` in line 10. Fourth, change `WL=64` to `WL=28` in line 20. Fifth, change `CLS` to `CALL CLEAR` in lines 50, 690, and 3000. Sixth, change `RND(5)` to `INT(RND*5)+1` in lines 180 and 190. Seventh, change `MID$` to `SEG$` in lines 280, 2000, and 3020. Finally, change lines 100, 110, 150, 370–410, 490, 520, 650, 3030, and 4010 to read as follows:

```
100 R$="PLEASE REGISTER AT HOTEL DESK.":GOSUB 3000:PR
INT
110 INPUT "YOUR NAME, PLEASE? ";N$::IF N$="" THEN 110
150 T=X+INT(RND*4)+1::T=T+5*(T>5)::IF PNT(T)>0 THEN 15
0
370 IF RND>.15 THEN 400
380 FOR I=1 TO 5::CALL SOUND(1500,208,0,1661,0)
390 FOR D=1 TO 400::NEXT D::NEXT I::GOTO 210
400 FOR I=1 TO 5::FOR Y=1 TO 20::CALL SOUND(10,440,1):
:NEXT Y
410 FOR D=1 TO 500::NEXT D::NEXT I
490 R$=R$&SEG$(Z$,1,3)&"-"&SEG$(Z$,LEN(Z$)-3,4)&".":G
OSUB 3010::GOSUB 4000::GOTO 210
520 INPUT "CHEF ":Z$::IF Z$="" THEN 520
650 PRINT:R$="(REMEMBER: THE THIEF WILL CHANGE.)":GOSU
B 3010:GOSUB 4000:GOTO 130
3030 NEXT I :: PRINT SEG$(R$,1,L):: R$=SEG$(R$,L+2,LEN
(R$)-L-1):: GOTO 3010
4010 CALL KEY(0,K,S)::IF S=0 THEN 4010 ELSE RETURN
```

TRS-80 Color Computer/*Recipe for Disaster*

Use the base version, except change `WL=64` to `WL=32` in line 20 and change lines 100, 380–410, and 650 to read as follows:

```
100 R$="PLEASE REGISTER AT HOTEL DESK.":GOSUB 3000:PRI
NT
380 FOR I=1 TO 5:SOUND 75,10
390 FOR D=1 TO 250:NEXT D:NEXT I:GOTO 210
400 FOR I=1 TO 5:FOR Y=1 TO 15:SOUND 150,1:NEXT Y
410 FOR D=1 TO 500:NEXT D:NEXT I
650 PRINT:R$="(REMEMBER: THE THIEF WILL CHANGE.)":GOSU
B 3010:GOSUB 4000:GOTO 130
```

TRS-80 Model 4/*Recipe for Disaster*

Use the base version, except change line 20 to read as follows:

```
20 WL=80:LT=0:T=1:W=0:DC=0:GUESS=0:PRINT CHR$(15)
```

VIC-20 w/8K RAM Cartridge/*Recipe for Disaster*

Use the base version, with the following alterations: Omit `CLEAR 1000`: from the beginning of line 10. In lines 50, 690, and 3000, change `CLS` to `PRINT CL$`. In lines 180 and 190, change `RND(5)` to `INT(RND(0)*5)+1`. Add line 4020:

```
4020 RETURN
```

Finally, change lines 20, 100, 110, 150–170, 240, 380–410, 520, 570, 650, 4000, and 4010 to read as follows:

```
20 WL=22:LT=0:T=1:W=0:DC=0:GUESS=0:CL$=CHR$(147)
100 R$="PLEASE REGISTER AT HOTEL DESK.":GOSUB 3000:PRI
NT
110 PRINT "YOUR NAME, PLEASE?":INPUT N$:IF N$="" THEN
110
150 T=X+INT(RND(0)*4)+1:T=T+5*(T>5):IF PNT(T)>0 THEN 1
50
160 IF X=4 AND PNT(5)=0 THEN PNT(5)=X:NEXT X
```


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```
170 PNT(T)=X:NEXT X
240 D$="":INPUT D$:IF D$="" THEN 240
380 FOR I=1 TO 5:POKE 36878,15:POKE 36875,180:FOR D=1
TO 500:NEXT D
390 POKE 36878,0:FOR D=1 TO 500:NEXT D:NEXT I:GOTO 210
400 FOR I=1 TO 5:FOR Y=1 TO 30:POKE 36878,15:POKE 3687
5,240:FOR D=1 TO 10:NEXT D
410 POKE 36878,0:NEXT Y:FOR D=1 TO 800:NEXT D:NEXT I
520 Z$="":INPUT "CHEF";Z$:IF Z$="" THEN 520
570 GOSUB 3000:PRINT:T$="":INPUT T$:IF T$="" THEN 560
650 PRINT:R$="(REMEMBER: THE THIEF WILL CHANGE.)":GOSU
B 3010:GOSUB 4000:GOTO 130
4000 PRINT:PRINT:PRINT:R$="PLEASE PRESS ANY KEY.":GOSU
B 1000
4010 GET T$:IF T$="" THEN 4010
```

SOLUTION TO LAST MONTH'S PUZZLE

*To figure out which six props make up the invention, and in which order they should be assembled, look at the first letter in the words of the instructions. For example, the instructions for the tank (prop #12) read: "*OVERTURN NEARBY EMPTY TANK.*" The first letters of the first three words spell "one," thus the tank is the first prop in the invention. The instructions for prop #15 spell out "two"; prop #4 "three"; prop #9 "four"; prop #7 "five"; and prop #2 "six." Therefore, you should type* 12.15.4.9.7.2 *into your computer to see a working version of the invention (which, by the way, is a popcorn popper!).*

PROGRAMMING P.S.

Corrections to Previous Months' Programs—and Enhancements Suggested by our Readers

CORRECTIONS . . .

Experienced programmers know how difficult it is to produce a program that is 100 percent free of "bugs"—and how many published programs contain errors. Our goal each month is to give you only perfect programs. However, programs we publish must go through many phases of development in a very short time, so errors could creep in at any stage, despite our constant testing. We are upset when this happens, because our hard work has gone to waste and because of all the trouble this causes you. We apologize.

We're constantly improving the process of developing programs. Meanwhile, we also retest programs after they have appeared in print. Here are errors we've found.

ADAM/*Top Secret* *(April, pages 83, 88)*
Some extra commas crept into lines 820, 840, and 860. Here's how those lines should appear:

```
820 HLIN a, b AT c
840 READ a,b,c
860 VLIN a,b AT c
```

Apple/*Proto and the Dormirians* *(April, page 106)*
The modification instructions for the Apple did not specify that the base version was the IBM PC*jr* program (given first in the section).

Apple/*Mystery Manor* *(March, page 109)*
The list of modifications should have stated that you must change DELAY to DLAY in line 380:

```
380 FOR DLAY=1 TO 3000:NEXT DLAY:GOTO 130
```

Atari/*Crossing Paths* *(January, pages 124, 125)*
Line 230 is correct as it appears on page 124; you should not use line 230 from the base version.

Atari/*Turkey Panic* *(November, pages 116, 117, 120)*
We regret that the Apple version of this program was printed under the Atari head as well as under the Apple head. If you would like a copy of the Atari translation of *Turkey Panic*, send a self-addressed, stamped envelope to Karen Cohen, "Atari Turkey Panic," FAMILY COMPUTING, 730 Broadway, New York, NY 10003.

IBM PC with advanced BASIC and PC*jr* with cassette BASIC/*Top Secret* *(April, page 92)*
When this program is run on the PC*jr*, *Cartridge* BASIC, not Cassette BASIC, is required.

IBM PC/*Proto and the Dormirians* *(April, page 106)*
The modification instructions for the IBM PC version did not specify that the base version was the PC*jr* program (given first in the section).

IBM PC*jr* w/Cartridge BASIC/*Proto and the Dormirians* *(April, pages 98, 100)*
Since the PC*jr* has an ENTER key rather than a RETURN key, you may want to change <RETURN> to <ENTER> in line 370.

TI-99/4A/*Decision Maker* *(January, page 120)*
The modification instructions tell you to change line 790 of the base version and add a new line 800. But the program also requires line 800 of the base version. To solve this problem, follow the modification instructions as published and then add a new line 820:

```
820 NEXT IC
```

TI-99/4A/*Cheerleader* *(November, page 112)*
This program requires TI Extended BASIC.

Timex Sinclair 1000 & 1500/*Egg Hunt* *(April, page 82)*
Since there is no exclamation mark on the 1000 and 1500 keyboards, you will have to substitute periods for the exclamation marks in lines 240, 420, 570, and 580.

Timex Sinclair 1000 w/16K RAM Pack/*Decision Maker* *(January, pages 118, 120)*
Lines 470 and 590 are incorrect as published. They should read as follows:

```
470 LET TF=C-1
590 IF R(C)<1 OR R(C)>10 THEN GOTO 580
```

Timex Sinclair 2068/*Mystery Manor* *(March, pages 108, 109)*
Line 150 is missing a quotation mark. It should read as follows:

```
150 LET N$="YOU'RE IN LOCATION #"+STR$(R):GOSUB 1000:L
ET N$="DATE: "+D$(VAL(R$(R,1 TO 2))):GOSUB 1000
```

Also, the second 10 in line 330 should be changed to 9:

```
330 FOR I=1 TO 10:PRINT S(I);:LET FLAG=FLAG+(S(I)<>INT
(SQR(G(I)-9))):NEXT I:PRINT
```

TRS-80 Color Computer & Models III & 4/*Proto and the Dormirians* *(April, pages 106, 108)*
The modification instructions for the TRS-80 versions did not specify that the base version was the IBM PC*jr* program (given first in the section).

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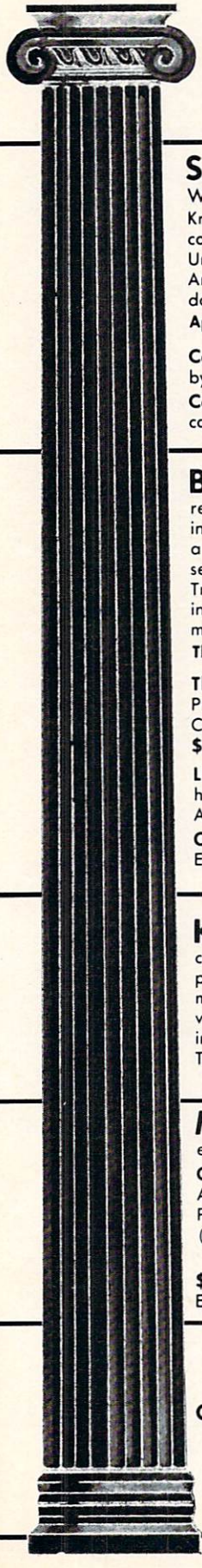

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TRS-80 Model III/*Type Test* *(January, page 127)*
Due to an editing error, this program does not give you accurate results if you use it more than once, unless you restart the program each time. To solve this problem, simply add `CLEAR:` to the beginning of line 130.

We apologize to the author and to our readers for this mistake.

VIC-20/*Mystery Manor* *(March, page 108)*
Stewart Buchanan of Wichita, KS, noticed that the modification instructions for the VIC-20 version were confusing. They should have read "Use the Commodore 64 version, but replace the number 40 with 22 in lines 2000 and 2010."

. . . AND ENHANCEMENTS

Once you've typed in and enjoyed one or more of our programs, we hope you'll try experimenting with them (remember, nothing you type in can harm your computer!). It's a great way to learn more about programming, and in the process, you might produce a version that you like even more.

Many of our readers have sent us success stories. One reader added sound to make a game more enjoyable. Another suggested slowing down a game so her 83-year-old mother could play it. We'll publish the best of these changes in this column.

We also encourage you to try translating our programs for other computers—especially the reader-written programs, which appear each month for only one computer. If you're willing, we'll publish your name and address here so that other owners of your brand of computer can write you (with a stamped, self-addressed envelope, of course) for copies of your translation.

ADAM/*Top Secret* *(April, pages 83, 88)*
You can display the elapsed time in a more logical place by changing line 720 to read

```
720 VTAB 5
```

Commodore 64/*New Year's Eve* *(January, pages 98, 104)*
Commodore owners Jim and Skip McCutcheon of Dayton, OH, write: "*New Year's Eve* is a great program. Thanks! Musically, however, the Auld Lang Syne tune drags in two places." They've changed the number 85 to 63 wherever it appears in the `DATA` statements (twice in line 5100 and twice in line 5130). Alternatively, they suggest changing the rhythm to triplets by replacing the last `126` in line 5090 and the first `126` in line 5130 with `85`. "Either way will keep the beat going smoothly."

Thanks, Jim and Skip! We have also received numerous requests for a 1985 version of the program. We welcome submissions from readers for all computers we cover to help us get a head start on next year.

IBM PC/*Proto and the Dormirians* *(April, page 106)*
When running the program, if you hold down a key too long the program may think you pressed the same key several times. To avoid this problem, you can add the following to the beginning of line 200:

```
200 DEF SEG=0:POKE 1050,PEEK(1052):
```

IBM PC*jr* w/Cartridge BASIC/*Proto and the Dormirians* *(April, pages 98, 100)*
When running the program, if you hold down a key too long the program may think you pressed the same key several times. To avoid this problem, you can add the following to the beginning of line 200:

```
200 DEF SEG=0:POKE 1050,PEEK(1052):
```

TI-99/4A w/TI Extended BASIC/*Mystery Manor* *(March, pages 106, 108)*
In line 80, the `O` (letter "O") in `READ ROOM$(I,O)` should have been a zero. However, since the value of the variable `O` is zero, the program works properly as printed.

TI-99/4A w/TI Extended BASIC/*Ski Trek* *(February, pages 100, 102)*
This program can easily be modified so that it doesn't require TI Extended BASIC. Just replace lines 1010, 1020, and 2100 with

```
1010 IF M<>66 THEN 1020
1020 IF M<>78 THEN 1030
2100 IF S<=H THEN 2120
```

and add the following lines:

```
1015 L=L-1
1025 L=L+1
2105 H=S
```

Our thanks go to Travis Zapp of Hanover, PA; George Kuc of Arcadia, CA; Manuel Ferreira of Methuen, MA; Richard L. Krieger of Eielson AFB, AK; and Kevin Dowell of Oregon City, OR, for pointing this out.

Kevin Dowell also found that you can transform the trees lining the downhill route into flags by changing line 90 to read

```
90 CALL CHAR(96,"007E7E7E42424242")
```

William L. Plank of Rockville, CT, had an additional twist. He found *Ski Trek* to be "an excellent program for concentration. I find, however, that adding a little sound will greatly increase the interest in this program." He produces sound effects by adding just three lines:

```
2035 FOR J=0 TO 16
2051 CALL SOUND(-99,-7,J,120,J,131,J)
2052 NEXT J
```

Timex Sinclair 1000 & 1500/*Egg Hunt* *(April, page 82)*
For a better screen display, try changing lines 400 and 460 to read as follows:

```
400 IF A$ = C$(R, TO LEN A$) THEN GOTO 450
460 FOR T = 1 TO 46
```

TRS-80 Models I & III/*Personal Valentine* *(February, pages 92, 94)*
You can make the name of your beloved stay on the screen longer if you delete line 640, add a new line 690:

```
690 PRINT @ 351+Q/2,F$;
```

and change line 780 to read

```
780 GOTO 690
```

VIC-20/*Jack-o'-Lantern* *(October, pages 66, 67)*
Dale Waymire of Greenville, OH, modified this program to slow down the drawing of the pumpkin and to make the program run over and over. He did it by adding three lines:

```
35 FOR F=1 TO 500:NEXT F
105 FOR F=1 TO 500:NEXT F
260 GOTO 10
```

and changing lines 10 and 170 to read as follows:

```
10 PRINT CHR$(147):RESTORE
170 FOR F=1 TO 2000:NEXT F
```

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FISH 'N' CHIPS A Program That Turns Your TI-99/4A Into A *Fishtank*!

BY HAYDN RUBELMANN

Up before dawn, Haydn sets off on a fishing expedition.

While our four children were growing up, they loved having a fishtank. But for some reason, when it came time to clean the algae from the sides and the mess in the rocks, they always had something else to do.

Well, I love my children and they loved their fish, so I didn't really mind being the "fish" that cleaned the tank. All 29 gallons of it.

Our children are now on their own, but as you may suspect, we now have grandchildren. Well, we learn with age, so I traded in the 29-gallon tank for a 19-inch color TV and a TI-99/4A computer, and got to work writing my *Fishtank* program in TI Extended BASIC.

Now my grandchildren will never get that sad look that comes from seeing a dead fish floating in the fishtank.

As for me, when I want to relax and watch the fish, I simply type RUN, press the ENTER key, and turn the volume up. When I wish to view the fish from across the room, I type "Y" for magnify. No more scrubbing algae from the side. I can clean this tank with the CLEAR key!

HAYDN RUBELMANN, *54, is a retired navy master chief who currently works in civil service as an electrical-engineering technician. He lives in Chesapeake, Virginia, with his wife, Edna.*

TI-99/4A w/TI Extended BASIC/*Fishtank*

```
9 REM  DEPRESS <ALPHA LOCK> BEFORE TYPING IN PROGRAM
10 CALL CLEAR :: DIM Z(26)
20 FOR X=1 TO 26 :: READ Z(X):: NEXT X
30 DISPLAY AT(12,9):"DO YOU WANT" :: DISPLAY AT(13,5):
"MAGNIFICATION? (Y/N)"
40 CALL KEY(0,K,S):: IF S=0 OR(K<>78 AND K<>89)THEN 40
 ELSE IF K=89 THEN CALL MAGNIFY(2)
50 CALL CLEAR :: CALL SCREEN(5):: CALL COLOR(9,2,13)
60 FOR X=33 TO 47 :: READ A$ :: CALL CHAR(X-52*(X>44),
A$):: NEXT X
70 FOR X=1 TO 26 :: READ A,B,C,D,E,F :: IF A+B+C+D+E+F
=Z(X)THEN 90
80 PRINT "YOU HAVE AN ERROR IN DATA";"STATEMENT";1000+
10*INT(X/10);"OR";3000+10*INT((X/2));"..." :: END
90 CALL SPRITE(#X,A,B,C,D,E,F):: NEXT X
100 FOR X=6 TO 12 :: READ A,B :: Q=Q+A+B :: CALL VCHAR
(A,X,97,B):: NEXT X :: IF Q<>166 THEN PRINT "YOU HAVE
AN ERROR IN DATA STATEMENT 4000."
110 CALL POSITION(#20,YPOS,XPOS):: IF YPOS<120 THEN CA
LL MOTION(#20,2,0):: CALL PATTERN(#20,43):: GOTO 110
120 IF YPOS>152 THEN CALL MOTION(#20,-1,0):: CALL PATT
ERN(#20,40):: GOTO 110
130 CALL POSITION(#17,YPOS,XPOS):: IF YPOS<136 THEN CA
LL MOTION(#17,4,0):: CALL PATTERN(#17,43):: GOTO 110
140 IF YPOS>152 THEN CALL MOTION(#17,-6,0):: CALL PATT
ERN(#17,40):: GOTO 110
150 CALL POSITION(#8,YPOS,XPOS):: IF YPOS<20 THEN CALL
 MOTION(#8,5,1):: GOTO 110 ELSE IF YPOS>124 THEN CALL
MOTION(#8,-9,1):: GOTO 110
160 CALL SOUND(50,533,3,444,4):: CALL SOUND(25,666,6,7
77,7):: GOTO 110
1000 DATA 284,292,340,307,183,202,206,330,261,288
1010 DATA 91,139,123,103,464,467,297,394,434,263
1020 DATA 314,317,306,302,442,459
2000 DATA 1F3E6CFFFF7C3E1F,080C9E7F7F9E0C08
2010 DATA 1CCE7FCE1C000000,002071FE71200000
2020 DATA 00388E7F8F380000,00000070F8F870FF
2030 DATA 0000000E1F1F0EFF,13337CFCBFFEFC78
2040 DATA 0C12126C96996906,609CA2614141221C
2050 DATA C8CC3E3FFD7F3F1E,0000182424180000
2060 DATA 444644C44464444C,78FC7A0101010D11
2070 DATA 3C7E8100304880C0
3000 DATA 33,9,64,182,-1,-3,33,9,48,204,-1,-1
3010 DATA 33,9,76,224,-1,-1,33,9,68,200,-1,-2
3020 DATA 34,11,108,28,0,2,34,11,122,34,0,1
3030 DATA 34,11,112,46,0,3,35,2,132,164,-4,1
3040 DATA 36,16,16,202,-1,-8,36,16,22,228,1,-15
3050 DATA 37,2,14,36,1,1,37,2,32,64,1,3
3060 DATA 37,2,23,56,1,4,37,2,36,26,1,1
3070 DATA 38,15,172,240,0,-1,39,15,172,240,0,1
3080 DATA 40,10,160,83,4,0,41,16,136,204,-3,0
3090 DATA 42,16,154,224,-2,0,43,10,150,58,2,0
3100 DATA 44,16,50,210,-6,0,44,16,45,220,-8,0
3110 DATA 44,16,35,215,-4,0,44,16,40,212,-10,0
3120 DATA 98,4,165,175,0,0,99,4,165,191,0,0
4000 DATA 21,2,20,4,18,6,16,8,17,7,19,5,20,3
```

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You're going to need all your cunning and intelligence to stop the FuzzBomb from turning the U.S.A. into a nation of fuzzbodies.

You're Agent U.S.A.,™ top investigator for the country's most elite intelligence organization. And now you've been assigned your toughest and most dangerous mission ever: stopping the evil FuzzBomb from turning every man, woman and child into helpless fuzzbodies.

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You're a scuba diver on a secret assignment. You must find and decipher giant words hidden deep beneath the sea. But to succeed you have to outmaneuver ferocious sharks and pesky flipper-nippers that are out to stop you.

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Scholastic™ Wizware

Agent U.S.A., Bannercatch, Spelldiver designed and developed by Tom Snyder Productions, Inc. Available for Atari and Commodore 64 computers. Apple and IBM versions available soon.

WHAT'S IN STORE

NEW HARDWARE ANNOUNCEMENTS*

IBM PORTABLE PC/RS-232C SMART CABLE/
MIKEL'S TI SERIAL CABLE/ATARI MEMORY EXPANDER

COMPUTERS

IBM Portable Computer

MANUFACTURER: IBM Entry Systems Division, P.O. Box 2989, Delray Beach, FL 33444; (305) 241-7614
PRICE: $2,795

For those people waiting for a portable computer from IBM, the wait is over. The new Portable PC, now available in limited quantities, weighs 30 pounds and measures 20 × 17 × 8 inches. This self-contained unit features 256K of RAM (expandable to 512K); a built-in 9-inch amber monitor capable of displaying graphics and 25 lines with 80 characters per line; a 360K slimline disk drive; plus five expansion slots in the system unit.

Because IBM expects that many businesspeople will bring the Portable PC on trips to foreign countries, the computer has a universal power supply that, with the addition of a power cord, can be used with different voltages. The system, which has a carrying handle, also comes with a carrying bag.

The IBM Portable uses the same 16-bit microprocessor as the IBM-PC, PC XT, and PC*jr*. With IBM DOS 2.1, the same DOS used in the PC*jr*, the portable can use most of the software already available for the other models. (Ask a dealer for a complete list.) An optional second slimline disk drive can be added to double disk storage to 720K.

**These products have been announced by manufacturers, but are not necessarily in the stores yet. Some products may still be under development, and others may be in test markets only. Call or write the manufacturer for expected date of delivery.*

New Kaypro 4

MANUFACTURER: Kaypro Corp., 533 Stevens Ave., Solana Beach, CA 92075; (619) 481-4300
PRICE: $1,995

Kaypro, the fourth-largest personal computer manufacturer after Apple, IBM, and Radio Shack, has enhanced its popular Kaypro 4 portable computer. This new model includes a 300-baud built-in modem, and a clearer high-resolution screen. It also processes information faster.

New screen features include clearer type fonts, screen highlighting, dual-intensity displays, on-screen graphics, and a blinking cursor. Plus, the screen can display 25 80-character lines (the old Model 4 could only display 24 lines). The new Kaypro 4, which costs $200 more than the old model, is sold with a variety of "bundled" software. Though the Kaypro uses the CP/M operating system, the Plus 88 version of the Kaypro 4 can run both MS-DOS and CP/M software.

INTERFACES

RS-232C Interface For TI-99/4A

MANUFACTURER: Mikel Laboratories, Inc., 3341 W. El Segundo Blvd., Hawthorne, CA 90250; (213) 679-2542
PRICE: $149.95

TI-99/4A computer owners who want to expand their present system but can't find or can't afford the TI Peripheral Expansion Box can use their computer with the RS-232C interface from Mikel Laboratories. With this free-standing serial interface unit, the TI-99/4A can connect to peripherals such as printers or modems without the TI expansion box.

Smart Cable 817

MANUFACTURER: IQ Technologies, Inc., 11811 N.E. First St., Suite 308, Bellevue, WA 98005; (206) 451-0232
PRICE: $75

If you've had trouble connecting peripherals to the serial port of your computer, and have had to make or buy custom RS-232C connecting cables, the Smart Cable 817 may be

the answer. The SC 817 consists of an RS-232C cable and a module that connects to the serial port on many computers. The module automatically reconfigures the pin settings in the cable to adapt to the peripheral you're connecting. For instance, instead of using one serial cable to connect a printer, and another to connect a modem, the Smart Cable can be used with both. The only computer we know of that isn't compatible with the Smart Cable is the Eagle 2.

MISCELLANEOUS

MicroRam Memory Board

MANUFACTURER: Microbits Peripheral Products, 225 W. Third St., Albany, OR 97321; (503) 967-9075
PRICE: $149.95

Atari 600XL owners can now extend their computer's 16K RAM memory to 64K by plugging in the MicroRam 64K Memory Board. The MicroRam requires no internal modification of the computer and lets the 600XL use any software the Atari 800XL uses. The memory board is completely compatible with all Atari peripherals and software.

A similar memory expander, the 1064 Memory Module, is being offered by Atari for about the same price. FC

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WHAT'S IN STORE SOFTWARE GUIDE

QUICK TAKES ON SOFTWARE—NEW AND NOTEWORTHY

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews of some programs follow the chart.

Here's a rundown of the ratings categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS AND HOME MANAGEMENT

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
BASIC ACCOUNTING Firefighter Software 31245 La Baya Drive Westlake Village, CA 91362 (818) 991-8200 $89 ©1983	Put personal and small-business finances in order with thorough accounting package, which contains time-saving features, tracks several different budget and expense categories, and prints out special reports for tax purposes.† —KRENGEL	Apple II w/Applesoft ROM/II plus/IIe, 48K (disk).	Defective disks replaced free w/in 1 year; free backup copy provided.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★	★ ★	A	★ ★ ★
CERTIFIED PERSONAL ACCOUNTANT Sundex Software Corp. 4755 Walnut St. Boulder, CO 80301 (303) 440-3600 $149.95 (IBM) $99.95 (Apple) ©1983	Organize family finances with thorough, fast-paced, easy-to-learn accounting system, which maintains several different kinds of accounts and features logical, straightforward operating system.† —CHRISTIAN	Reviewed on IBM PC/ PC*jr*, 128K (disk). Also for Apple II/II plus/IIe, 64K (disk). Version planned for Commodore 64 (disk).	Defective disks replaced free w/in 90 days; user makes backup copy.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	n/a	E	★ ★ ★
HOME-CALC SIM Computer Products 1100 E. Hector St. Whitemarsh, PA 19428 (215) 825-4250 $34.95 (Commodore) $39.95 (Atari) ©1983	Track family budgets, maintain records and sports statistics, and perform different kinds of calculations with simple ledger-page simulation program. Lacks sophisticated features but is fine for home use.† —AKER	Reviewed on Commodore 64 (disk and cassette). Also for Atari 400/800/XL series, 24K (disk), 16K (cassette). Versions planned for Apple and IBM PC/PC *jr*.	Defective materials replaced free w/in 90 days; $5 fee thereafter or if user-damaged; user makes backup copy.	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	n/a	E	★ ★ ★ ★
MAGIC DESK I Commodore Business Machines 1200 Wilson Drive West Chester, PA 19380 (215) 431-9100 $69.95 ©1983	Type simple documents and short letters on very limited typewriter-simulation program, which uses pictures to assist first-timers. Flawed by lack of basic features such as those that automatically wrap words to next line. —AKER	Commodore 64 (cartridge). Joystick required.	Defective cartridges replaced free w/in 90 days; $35 fee thereafter or if user-damaged.	★ ★	★ ★	★ ★ ★	★ ★	A	★
PRACTIFILE Computer Software Assoc. The Silk Mill, 44 Oak St. Newton Upper Falls, MA 02164 (617) 965-9870 $54.95 ©1983	Store address and club-membership lists, family inventory, health records, client or contact files in data-management program which lets you print out portions of files and perform simple calculations. Easy to learn, with clear instructions. —ODISIO	Commodore 64 (disk).	Defective disks replaced free w/in 90 days; $5 fee thereafter or for backup copy.	★ ★ ★	★ ★ ★	★ ★ ★ ★	n/a	E	★ ★ ★ ★

RATINGS KEY **O** Overall performance: **D** Documentation: **EH** Error-handling: **GQ** Graphics quality: **EU** Ease of use: **V** Value for money: ★ Poor: ★★ Average: ★★★ Good: ★★★★ Excellent: n/a Not applicable: E Easy: A Average: D Difficult: † Longer review follows chart

See Jane.
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These days, kids like Jane are running computers. And with CBS Software, they could be running smart.

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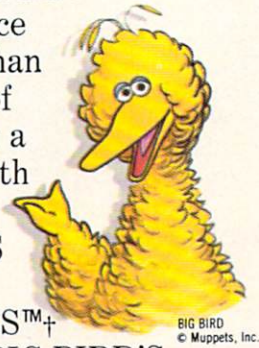
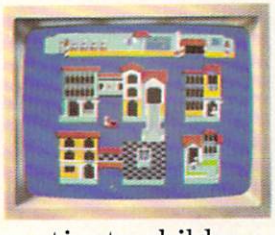


BIG BIRD © Muppets, Inc.

See our screens.

Of course, you like what goes *into* the programs. But kids like what goes *onto* the screens. So programs like DUCKS AHOY!™ and SEA HORSE HIDE 'N SEEK™ captivate children with colorful graphics and lively tunes.



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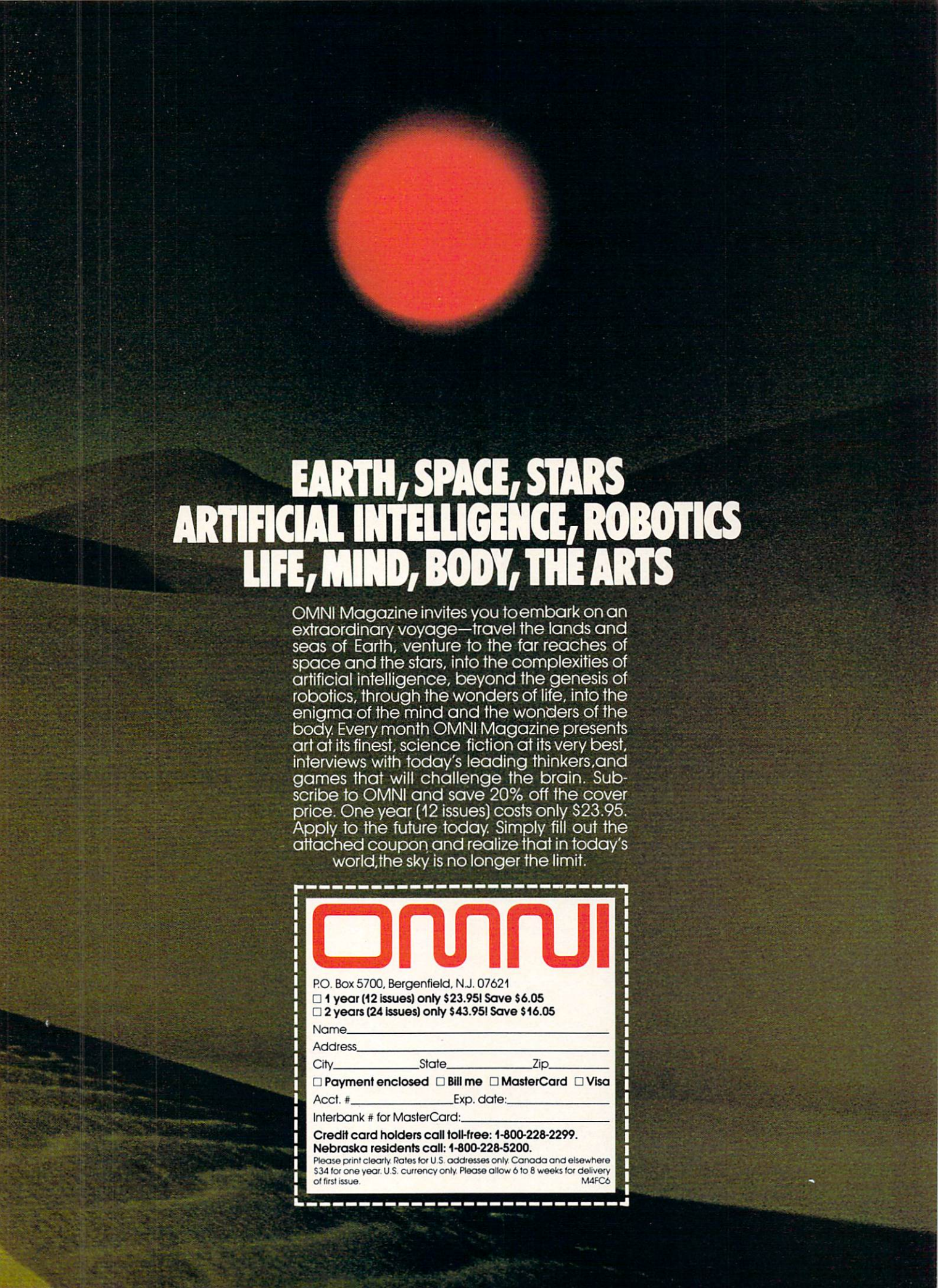
SOFTWARE GUIDE

EDUCATION/FUN LEARNING

Title Manufacturer Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
FACE ODYSSEY Red Balloon Software N. 17016 Madison Road Mead, WA 99021 (509) 238-4640 $9.95 ©1983	Kids ages 3+ interchange parts of a head and face, then animate and print out creations in easy-to-load creative, fun program that makes good use of Timex's limited graphics and memory.† —HOORNAERT	TS 1000/1500, 2K (cassette).	Defective cassettes replaced free.	★★★★	★★★	★★★★	★★★	E	★★★★
FRACTION FEVER Spinnaker Software Corp. 215 First St. Cambridge, MA 02142 (617) 868-4700 $34.95 ©1983	Practice fractions in arcade-like game best suited to kids in fifth grade and up. What exactly is going on is difficult to understand, but kids seem to like game aspects. —BYRNE	Reviewed on Commodore 64 (cartridge). Also for Apple II/II plus/IIe, 48K (disk); Atari 400/800/XL series, 48K (disk); Coleco ADAM, 8K (cartridge); IBM PC/PC*jr*, 64K (disk). Joystick required for ADAM.	Defective materials replaced free w/in 30 days; $12 fee if user-damaged or for backup copy.	★★	★★	★★★	★★★	D	★
KEY LINGO Reader's Digest Software Pleasantville, NY 10570 (800) 431-8800 $39.95 © 1983	Kids ages 11+ voyage in the Sea of Words in adventure game that teaches spelling and meaning of 250 important words or those you add yourself.† —MORRIS	Apple II/II plus/IIe, 48K (disk).	Defective disks replaced free w/in 90 days; $15 fee if user-damaged.	★★★	★★★	★★★★	★★★	A	★★★
MEMORY CASTLE Sunburst Communication 39 Washington Ave. Pleasantville, NY 10570 (800) 431-1934 $39.95 ©1983	Improve ability to remember unrelated facts with special technique presented in challenging, fun adventure format that really works. Best for kids ages 10+. —MORRIS	Apple II/II plus/IIe, 48K (disk). Color TV or monitor required.	Defective disks replaced free w/in 90 days; $10 fee thereafter or for backup copy.	★★★	★★★	★★★	★★★	A	★★
PYTHAGORAS AND THE DRAGON Krell Software Corp. 1320 Stony Brook Road Stony Brook, NY 11790 (516) 751-5149 $39.95 ©1981	Practice math in 10 skill levels, answering true-and-false questions to increase combat power in all-text adventure game best suited to ages 12+. —MORRIS	Reviewed on Apple II/II plus/IIe, 48K (disk). Also for Commodore 64 (disk); TRS-80 Models I/III/4, 48K (disk). Versions planned for IBM PC/PC*jr*, 48K (disk).	Defective disks replaced free w/in 30 days; $12 fee for backup copy.	★★	★	★★★	n/a	A	★★
SNOOPER TROOPS #1 Spinnaker Software Corp. 215 First St. Cambridge, MA 02142 (617) 868-4700 $44.95 ©1982	Kids ages 10+ (and adults) practice the art of deduction, problem-solving strategies, logic, and note-taking skills while trying to solve the mystery of a seemingly haunted house.† —MORRIS	Reviewed on Apple II/II plus/IIe, 48K (disk). Also for Atari 400/800/XL series, 48K (disk); Commodore 64 (disk); IBM PC, 64K (disk).	Defective disks replaced free w/in 30 days; $12 fee if user-damaged or for backup copy.	★★★★	★★★★	★★★★	★★★★	A	★★★★
SPELLDIVER Scholastic Wizware 730 Broadway New York, NY 10003 (212) 505-3000 $29.95 ©1984	Clear moss off huge letters to guess preprogrammed words, or those you enter yourself, in intriguing, colorful, if slow-moving word-recognition game for ages 6+.† —LAMB	Reviewed on Atari 400/800/XL series, 48K (disk). Also for Commodore 64 (disk). Version planned for Apple, IBM PC/PC*jr*. Joystick required.	Defective disks replaced free w/in 60 days; $5 fee for 10 months thereafter.	★★★	★★★	★★★★	★★★	E	★★★
TRAP-A-ZOID DesignWare 185 Berry St. Bldg. 3, Suite 158 San Francisco, CA 94107 (415) 546-1866 $39.95 ©1983	Kids try to trap Zoids in geometric shapes in fun action game which tests geometry knowledge (shapes and vocabulary) at five levels. Best suited to ages 8+. —MORRIS	Reviewed on Apple II/II plus/IIe/III w/emulator, 48K (disk). Also for Atari 400/800/XL series, 48K (disk); IBM PC/PC*jr*, 64K (disk). Color monitor or TV recommended. Displays only 3 colors w/RGB monitor.	Defective disks replaced free w/in 90 days; backup copy available for $12.	★★★	★★★★	★★★★	★★★	A	★★★
TYPE ATTACK Sirius Software Inc. 10364 Rockingham Drive Sacramento, CA 95827 (916) 366-1195 $39.95 ©1982	Slow, intermediate, or would-be typists shoot letters and words out of the sky in fast-action typing arcade game with 40 lessons at progressive skill levels, and room for up to 60 lessons you customize yourself. —MORRIS	Reviewed on Apple II/II plus/IIe/III w/emulator, 48K (disk). Also for Atari 800/XL series, 48K (disk); Commodore 64 (disk), VIC-20, 5K (cartridge); IBM PC, 64K (disk).	Defective materials replaced free w/in 30 days; $5 fee thereafter.	★★★★	★★★	★★★★	★★★	A	★★★★

RATINGS KEY **O** Overall performance: **D** Documentation: **EH** Error-handling: **GQ** Graphics quality: **EU** Ease of use: **V** Value for money: ★ Poor: ★★ Average: ★★★ Good: ★★★★ Excellent: n/a Not applicable: E Easy: A Average: D Difficult: † Longer review follows chart



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GAMES

Title Manufacturer Hardware	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
THE ALPINE ENCOUNTER Ibidinc. 179 Allyn St., Suite 607 Hartford, CT 06103 (203) 547-0085 $39.95 ©1983	Interview characters, pick up clues to solve a crime and save the world in complex arcade game/text adventure hybrid best for group play. Good for ages 12+. —DELSON	Reviewed on Apple II/II plus/IIe, 48K (disk). Also for Commodore 64 (disk). Versions planned for IBM PC/PC*jr*, 64K (disk).	Defective or user-damaged disks replaced free w/in 30 days; $10 fee thereafter.	★★★	★★	★★	★★★	D	★★
ENCOUNTER! Synapse Software 5221 Central Ave. Richmond, CA 94804 (415) 527-7751 $34.95 ©1983	Dodge and destroy saucers, low-flying missiles in challenging, visually superior variation on arcade game *Battlezone*, with space-age 3-D effects. One of year's best, for ages 10+. —DELSON	Reviewed on Atari 400/800/XL series, 32K (disk). Also for 16K (cassette). Joystick(s) required.	Defective disks replaced free w/in 90 days; $5 fee thereafter or if user-damaged.	★★★★	★★★	★★	★★★	D	★★★★
GATEWAY TO APSHAI Epyx, Inc. 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 approx. $30 ©1983	Voyage through a maze's eight levels, blazing a safe trail to the Temple of Apshai while fending off ogres and ghouls, and gathering treasure for points in arcade adventure.† —DELSON	Reviewed on Commodore 64 (cartridge). Also for Atari 400/800/XL series, 16K (cartridge). Joystick(s) required. Version planned for ADAM.	Defective cartridges replaced free w/in 30 days; $10 fee thereafter.	★★★	★★	★★★	★★★	A	★★★
LODE RUNNER Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 479-1170 $34.95 $39.95 (Commodore 64 cartridge) ©1983	Grab gold chests, evade Keystone Kops-like pursuers in exciting, versatile ladder game which lets you develop your own game by building additional levels, and opt to play with unlimited lives. For ages 8+.† —DELSON	Reviewed on IBM PC, 64K (disk). Also for Apple II/II plus/IIe, 48K (disk); Atari 400/800/XL series, 48K (disk); Commodore 64 (disk and cartridge); VIC-20, 5K (cartridge). Joystick(s) optional.	Defective materials replaced free; $5 fee if user-damaged.	★★★★	★★★	★★★	★★	D	★★★★
SILICON WARRIOR Epyx, Inc. 1043 Kiel Court Sunnyvale, CA 94089 (408) 745-0700 approx. $40 ©1983	Teleport across grid, trying to form unbroken bands of colored boxes before the opposition can do the same. Use lasers to advance in arcade/strategy game for ages 10+. —DELSON	Reviewed on Atari 400/800/XL series, 16K (cartridge). Version planned for Commodore 64 (cartridge).	Defective materials replaced free w/in 30 days; $5 fee thereafter.	★★★	★★★	★★	★★★	A	★★
SPARE CHANGE Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 479-1170 $34.95 ©1983	Collect and deposit game tokens for points while stalling the zany, computer-controlled "zerms" who want to foil your play. Ideally suited to beginning players ages 8+. —DELSON	Reviewed on Commodore 64 (disk). Also for Apple II/II plus/IIe, 48K (disk); Atari 400/800/XL series, 48K (disk).	Defective disks replaced free; $5 fee if user-damaged.	★★★	★★	★★	★★★	A	★★
STAR TREK Texas Instruments P.O. Box 53 Lubbock, TX 79408 (800) 842-2737 $29.95 ©1983	Fly your starship around the galaxy, destroying enemies with Photon Torpedoes and Phasers. Engage warp drive for high speeds in fun-to-play arcade game, for ages 8+. —DELSON	TI-99/4A, 16K (cartridge). Joystick(s) required.	Defective cartridges replaced free w/in 90 days; $11 fee thereafter.	★★★	★★★	★★	★★	E	★★★
SUSPENDED Infocom, Inc. 55 Wheeler St. Cambridge, MA 01238 (617) 492-1031 $49.95 ©1983	Save civilization by controlling and operating a series of computers from a state of suspended animation in which only your brain functions. Clever, tough text-only adventure game for ages 12+.† —DELSON	Reviewed on Apple II/II plus/IIe, 32K (disk). Also for Atari 400/800/XL series, 32K (disk); Commodore 64 (disk); IBM PC/PC*jr*, 48K (disk); TI-99/4A, 32K (disk); TRS-80 Models I/III/4, 32K (disk).	Defective disks replaced free w/in 90 days; $5 fee thereafter or if user-damaged; user makes backup copy w/IBM disks.	★★★	★★★	★★★	n/a	D	★★★
TIGERS IN THE SNOW Strategic Simulations, Inc. 883 Stierlin Rd., Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 $39.95 ©1981	Encircle and isolate enemy units, or dig in and withstand the enemy in action-packed war game which recreates German-American encounter in Battle of the Bulge. Intermediate game for ages 12+.† —DELSON	Reviewed on Commodore 64 (disk). Also for Apple II/II plus/IIe, 48K (disk); Atari 400/800/XL series, 40K (disk and cassette); IBM PC/PC*jr*, 64K (disk).	Defective disks replaced free w/in 30 days; $10 fee thereafter or for backup copy.	★★★	★★★	★★★	★★	A	★★
TRIPLE BRAIN TRUST Reston Publishing Co. 11480 Sunset Hills Road Reston, VA 22090 (800) 336-0338 $39.95 ©1983	Select from 12 categories or write your own questions to use in tic-tac-toe-like word game, which lets players of different age and skill levels compete—for ages 5+.† —DELSON	Reviewed on IBM PC, 64K (DOS 1.1 disk). Also for 128K (DOS 2.0 disk).	Defective disks replaced free w/in 90 days; $10 fee thereafter or for backup copy.	★★★	★★★★	★★★	n/a	E	★★★

RATINGS KEY **O** Overall performance: **D** Documentation: **EH** Error-handling: **GQ** Graphics quality: **EU** Ease of use: **V** Value for money: ★ Poor; ★★ Average; ★★★ Good; ★★★★ Excellent; n/a Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart

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WHAT'S IN STORE SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 110 for information such as backup policies and addresses of software manufacturers.

HOME BUSINESS & HOME MANAGEMENT

Basic Accounting

HARDWARE REQUIREMENTS: Apple II w/ Applesoft ROM/II plus/IIe, 48K (disk).
MANUFACTURER: Firefighter Software
PRICE: $89

If you're meticulous about your finances, or if you bought a computer and are disappointed because your finances have not fallen into place miraculously, you should consider the benefits of *Basic Accounting*.

Thanks to a complete manual with three tutorials, and disks preprogrammed with sample accounts, it should take about a day's worth of effort to master the program. The uninitiated will appreciate the glossary of computer terms, which covers basic words and concepts like "warm boot" and "cold boot."

The package contains several features that will cut down on the time you'll have to invest to get your house in order—features that let you develop permanent budget categories and then assign a special abbreviation to them to make entry less of a chore, or that let you integrate accounts so that a bill paid here will be recorded in an expense account there.

You'll have access to any of a number of different kinds of accounts (limited by the size of your data disk) and be able to print out budget or expense reports. One particularly useful option, at tax time, for instance, lets you print out "search reports"—custom reports that pick out all payments made to one particular person or institution, all deposits made on a certain date, or all entries in a particular tax category.

If security's a concern, *Basic Accounting* has several safeguards against losing data by inadvertently turning off the machine before saving your work. And privacy is assured through the optional use of a password. —LARRY KRENGEL

Certified Personal Accountant

HARDWARE REQUIRED: IBM PC, 128K (disk). Also for Apple.
Version planned for Commodore.
MANUFACTURER: Sundex Software Corp.
PRICE: $149.95 (IBM), $99.95 (Apple)

If you're going to take the plunge and use a computer to manage your personal finances, then you should dip into *Certified Personal Accountant (CPA)*. It does everything your flesh and blood CPA might do and more, without the wisecracks.

As with any management system, getting started is time consuming. *CPA* has a good on-screen help-message system. The easy tutorial, which walks you through the steps of establishing budget and tax categories for all your expenditures, also helps. You enter your various bank accounts, sources of income, and assets. Then you're on your way to maintaining records for all your cash flows and expenses.

All selections are made from complete lists of operations written in clear language. You move a blinking arrow to the activity or account you want to handle. Hitting the first letter of the activity often allows immediate access to one of the many routines. Some budgeting programs run so slowly you lose your train of thought as the disk drives churn. Not *CPA*; it's got an exceptionally fast response time.

It's smart, too. If you write a personal check to VISA to make a credit card payment, the program takes your checking account entry and automatically credits your charge account. Not only does it keep your accounting for a given category, it integrates all the categories to provide an accurate assessment of your finances at the touch of a button. If you want, you can estimate your expenses for a particular category, and the program will show you which months your projections were under and over expenditures (how depressing!).

I must confess, using *CPA* for a month made me so financially self-aware, it nearly drove me to a cavernous retreat in the forest. I'd rather hand the accountant an armful of shoeboxes and hope for the best, but if it's money you want to manage, *Certified Personal Accountant* is one of the best packages I've seen. —KAARE CHRISTIAN

Home-Calc

HARDWARE REQUIREMENTS: Commodore 64 (disk). Also for Atari.
MANUFACTURER: SIM Computer Products
PRICE: $34.95

This is the first spreadsheet program I've seen that I can wholeheartedly recommend for home use. If it lacks some of the fancier spreadsheet options, it also lacks the fancy price. And, as a result of having fewer options, it is easier to work with.

Think of a spreadsheet program as electronic paper full of rows and columns. It can serve to keep track of your checkbook, your budget, your child's baseball team statistics, or anything else that you might want to arrange in a row/column format. The electronic advantage is the computer's ability to perform calculations with the data you've entered.

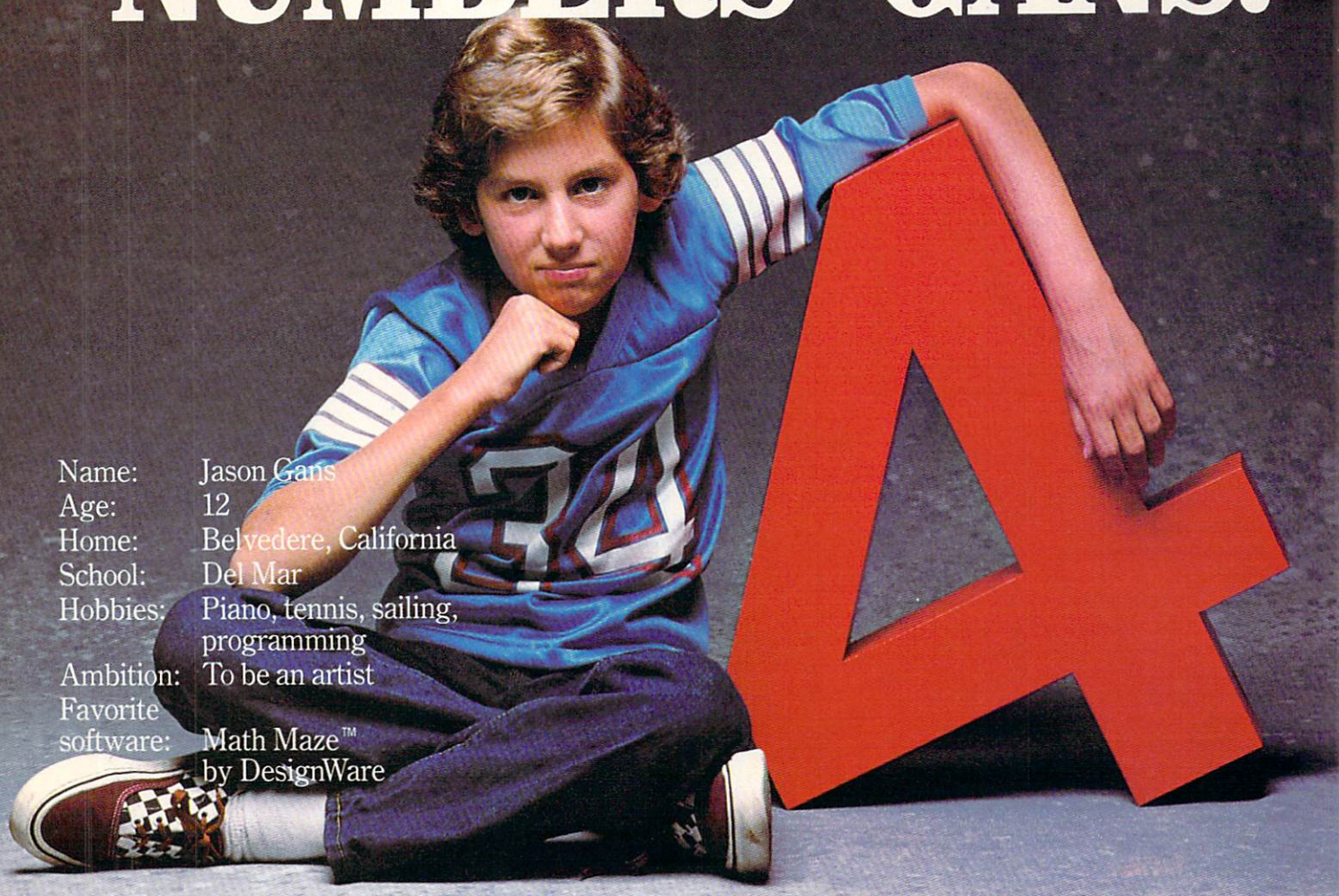
Each row/column spot, called a "cell," has a name that refers to its position on the spreadsheet, like A1 or B7. You can have the computer give you the total of column A, the average for row 5, or any other similar operation.

Home-Calc has 26 adjustable-width columns and 99 rows—plenty of room for just about any home application, although probably a little limited for small-business applications. If you're going to do any intensive spreadsheeting, you'll miss the "search" feature (which helps you pinpoint an entry you've made) found in more sophisticated "calcs." Since the spreadsheet isn't that large, a visual search, in which you scroll through the entries, isn't too difficult.

Replication—repeating cell entries—is simple with *Home-Calc*, as is blanking out cells for which you have no need. One keystroke will move you over a row, a column, or a whole screen, horizontally or vertically.

With its short, simple, explicit instruction manual, unbeatable price, and remarkable ease of use, *Home-Calc* is highly recommended for use in the home. Its limited size and lack of search capabilities hardly matter. —SHARON ZARDETTO AKER

THEY CALL HIM "NUMBERS" GANS.



Name: Jason Gans
Age: 12
Home: Belvedere, California
School: Del Mar
Hobbies: Piano, tennis, sailing, programming
Ambition: To be an artist
Favorite software: Math Maze™ by DesignWare

"*Math Maze* is neat because you do more than just add and subtract numbers all the time. You've got to find them first. And then get there before you get caught.

"It's got real good graphics. I can even change the background color. And make the math as challenging as I want.

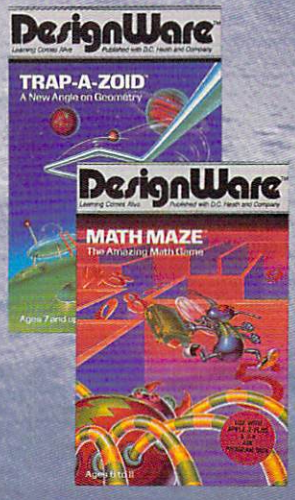
"There's lots of mazes, too. But the best thing is, I can make up my own. So when my friends come over, I've always got something new."

DESIGNWARE MAKES LEARNING COME ALIVE.

DesignWare math programs, like all DesignWare games, combine computer fun with sound educational principles to help improve your youngster's academic skills. The spelling game *Crytpo Cube*,™ in fact, has just been selected by LEARNING magazine as one of the year's outstanding software products. There are many other DesignWare programs too, in spelling, geometry, and language arts.

All DesignWare programs run on these computers with disk drive: Apple,® Atari,® Commodore 64,™ IBM PC and IBM PC Jr. See your local software retailer or call us at (800) 572-7767 (in California, 415-546-1866) and ask for our free catalog.

As Jason Gans says, "Hey—they don't call me 'Numbers' for nothing, you know!"



DesignWare™
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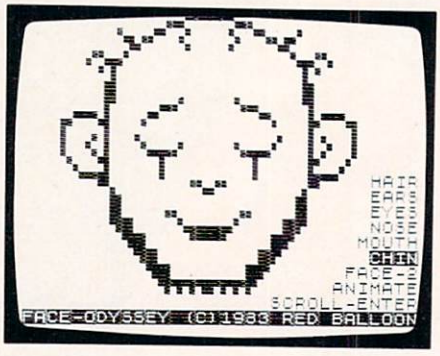
WHAT'S IN STORE
SOFTWARE REVIEWS

EDUCATION/ FUN LEARNING

Face Odyssey

HARDWARE REQUIREMENTS: TS 1000/ 1500, 2K (cassette).
MANUFACTURER: Red Balloon Software
PRICE: $9.95



Our house is crawling with kids—ages 1, 2½, 4, and 8. Rare indeed is the Timex program useful for any but my 8-year-old. That's why *Face Odyssey* is so welcome at our house. Everyone but the baby gets in on the act.

In this nonviolent, noncompetitive game, you make a face on the screen by choosing various features, then animate it. You start out by selecting the hairstyle. Pressing the "B" key moves you on to the next feature: the ears, the types of which you can scan by pressing the ENTER key. When you've got the ears you want, move on to the eyes, nose, mouth, and chin. Minimal reading and the use of just two keys allows preschoolers to enjoy *Face Odyssey* along with everyone else.

The program lacks the fancy features of Spinnaker's *FaceMaker*, for Apple and Commodore computers. One unique feature it does have, however, is by far the most popular option at my house. Pressing the "Z" key copies the face onto the Timex Sinclair printer. My 2½-year-old especially likes using the printer.

Any TS 1000 owner knows how hard it can be to load programs on cassette. *Face Odyssey* is easier and faster to load than any commercial program I've tried. —ED HOORNAERT

Key Lingo

HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk).
MANUFACTURER: Reader's Digest Software
PRICE: $39.95

You're sailing the Sea of Words in search of the Tablet of Wisdom. To find the Tablet you must put together a chart, the pieces of which are scattered among the islands around you—islands like Wacky Key Beach and I Don't Care Atoll! You go from island to island, buying and trading words and then using your cargo on other islands to answer questions. Every time you answer a question correctly, you earn coconut currency. If you run into pirates, you lose coconuts. And if you land on an island that requires a word not in your cargo, you'll be charged a landing fee. Clever seafarers will eventually collect enough coconuts to enter a master wordsearch contest which determines whether or not they will find the Tablet of Wisdom.

Key Lingo teaches both the spelling and the meaning of 250 important words of varied difficulty and familiarity—words such as recital, appreciate, recycle, and satirize. Each game uses only a few words at a time. You can study the words and their meanings for as long as you wish before you start your journey. You can also add words to the dictionary using a simple editing routine, making *Key Lingo* an especially flexible package for such uses as practicing weekly spelling lists.

Four players at a time can compete to be the first to find the Tablet of Wisdom. Kids found the keyboard commands simple and easy to use (basic N,S,E,W commands propel you about the seas), and the game overall a genuine challenge. The words are not too easy (the suggested minimum age for use is 11 years old), and the documentation is clear. In spite of the fact that its pace is sometimes slow, and the simple rhymes that greet your arrival on each island get boring after a while, *Key Lingo* was deemed to be a truly entertaining and enjoyable way to improve vocabulary skills.

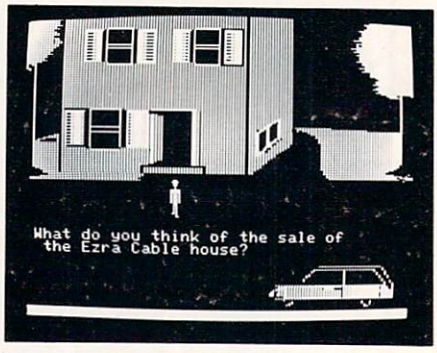
—TONY MORRIS

Snooper Troops #1

HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk). Also for Atari, Commodore, and IBM.
MANUFACTURER: Spinnaker Software
PRICE: $44.95

The Kims have just moved into the Cable mansion. Vacant since 1906, it's rumored to be haunted and sure enough, strange things start to occur: lights flicker, footsteps are heard, the cat disappears from a locked room. Is there really a ghost? Or is someone deliberately trying to scare the Kims?

You are called in as private detective, and like any good detective, you begin to collect information. Motoring about in your SnoopMobile, you interview people, take SnoopShots of clues, use the SnoopNet computer—while jotting down all notes in the book provided with the package.



Snooper Troops helped establish designer Tom Snyder's well deserved reputation as a maker of fine educational software. The documentation is excellent—readable, entertaining, and thorough. The graphics are excellent. Clues are subtle and numerous. Several realistic details, such as the actual passage of time, further enhance the package.

The learning here isn't standard schoolroom stuff. It involves thinking processes such as deduction and inference, and becoming aware of the best strategies for problem solving. You must continually review what you've learned and reevaluate hypotheses about suspects. The interactive environment of the computer is ideally suited to teaching these kinds of skills.

Kids genuinely enjoyed the note taking and the challenging puzzle solving. It is tough going close to the end, and some young testers complained about the slow pace of the program (your SnoopMobile crashes frequently and stays at the repair shop too long), but objections were

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Look for Scholastic Wizware at your local computer store. *Or contact Scholastic Inc., 730 Broadway, New York, NY 10003, 212-505-3000.*

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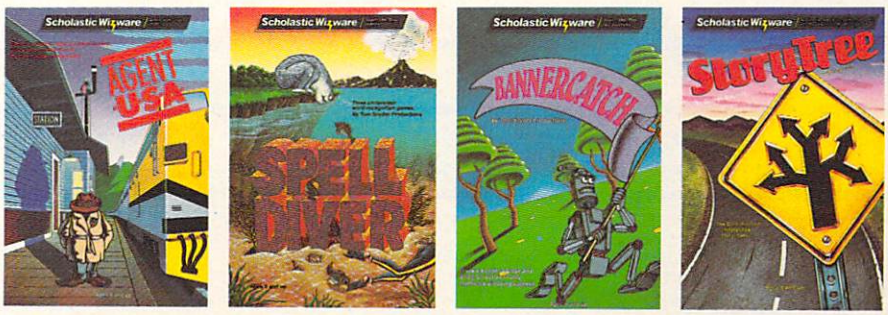

Agent U.S.A., Spelldiver, Bannercatch designed and developed by Tom Snyder Productions, Inc. Story Tree designed and developed by George Brackett. • Agent U.S.A., Spelldiver, Bannercatch available for Atari 800/1200/XL. Commodore, Apple, IBM versions available soon. • Story Tree available for Apple.

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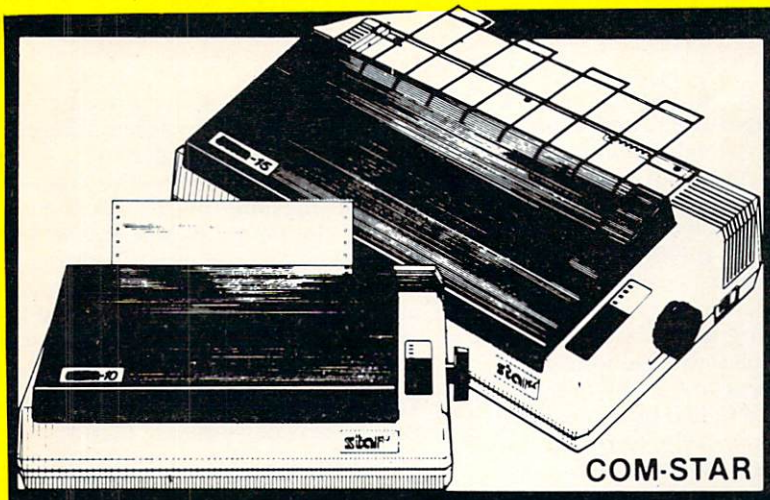

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to a ladder, as other arcade characters can, it can trap pursuers in any of a number of ingenious ways, including walling them into hollow chambers or stranding them in overhead traps.

Practice is as important as sheer skill in *Lode Runner*. I'm no arcade whiz, but I found my digging, running, and climbing abilities improved with every hour. And, once I got the basic skills down, the game took on a new dimension.

—JAMES DELSON

Tigers in the Snow

HARDWARE REQUIREMENTS: Commodore 64 (disk). Also for Apple, Atari, and IBM.
MANUFACTURER: Strategic Simulations
PRICE: $39.95

Many war games require a huge amount of strategic planning to play. You have to worry about how each little battle will affect the bigger campaign. *Tigers in the Snow* is for those who seek the challenge of fast action, encounter by encounter maneuvering. Here the Germans and the Americans are pitted against one another in World War II's famous Battle of the Bulge. The Germans are trying to break through the initially weak American lines and exit the mapboard, seizing key strongholds along the way. The Yanks attempt to stave the German flood until reinforcements can be rushed to their assistance.

By applying tactics such as encirclement, isolation, and blitzkrieg (lightning warfare or the overrunning of entrenched positions with superior forces), the Germans can make quick initial advances up to and through the U.S. positions. Then, by avoiding combat, they can send units off the board to build up their victory points and entrench themselves against American counterattacks. On the other hand, the U.S. forces have to fight defensively at first. As soon as their reinforcements arrive they must try to eliminate the Germans.

Tigers in the Snow is the most action-packed war game I have played thus far. Almost every unit in the game engages in multiple combat at some point. Play features include a variety of attack methods. As with all Strategic Simulations war games, game options let you select different levels of complexity, alter the strengths of each side, and choose to fight the computer or a person. Not for the novice player, this is a good game for pros over 12 who have mastered such beginning war games as *Knights of the Desert* and *The Road to Gettysburg*. —JAMES DELSON

Triple Brain Trust

HARDWARE REQUIREMENTS: IBM PC, 64K (DOS 1.1 disk), 128K (DOS 2.0 disk).
MANUFACTURER: Reston Software
PRICE: $39.95

The ideal computer word game gives players of varying ages and abilities the opportunity to enjoy the program and compete on his or her own level. The problem in other similar games has been that one level is generally set for all players. *Triple Brain Trust* allows participants to choose play levels best suited to them.

A combination of a guessing game and tic-tac-toe, *Triple Brain Trust* rewards correct answers with "X"s

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or "O"s which can be placed on a tic-tac-toe board to win or block the other player's moves. Strategy, simple as it is, can be crucial, because it's possible to answer the questions correctly but still make the wrong move and lose the game.

The package includes a question disk with 12 categories worth of questions, featuring subjects like "Early Learning" for ages 5–8; "Science" for ages 8–11; "Famous People" for ages 9–13; and, on the most difficult level, "Geography" and "Baseball Trivia" for ages 10–adult, and "Famous Places" for players age 11–adult. While the younger age groupings seem reasonable, the older age groupings lump together fourth and fifth-graders with grown-ups, not an entirely satisfactory nod to fairness.

With the exception of that little imbalance, *Triple Brain Trust*'s questions are fair. Kids especially enjoyed playing each other, for the game is fun and easy to master with adult supervision, once the basics have been learned. But playtesting showed that in child-vs.-adult games, where the 10–adult group questions were used, the kids were regularly beaten. One son finally refused to play against his father because he felt the computer was "rooking" him. The best way around this fault is to take advantage of the game's extremely powerful question-writing capabilities—its main attraction for families. Everyone can make up questions and type them into the game. This is an especially appealing way to study for tests. Students can enter their schoolwork in the form of questions, then they can "play" to their hearts' content.

—JAMES DELSON

Suspended

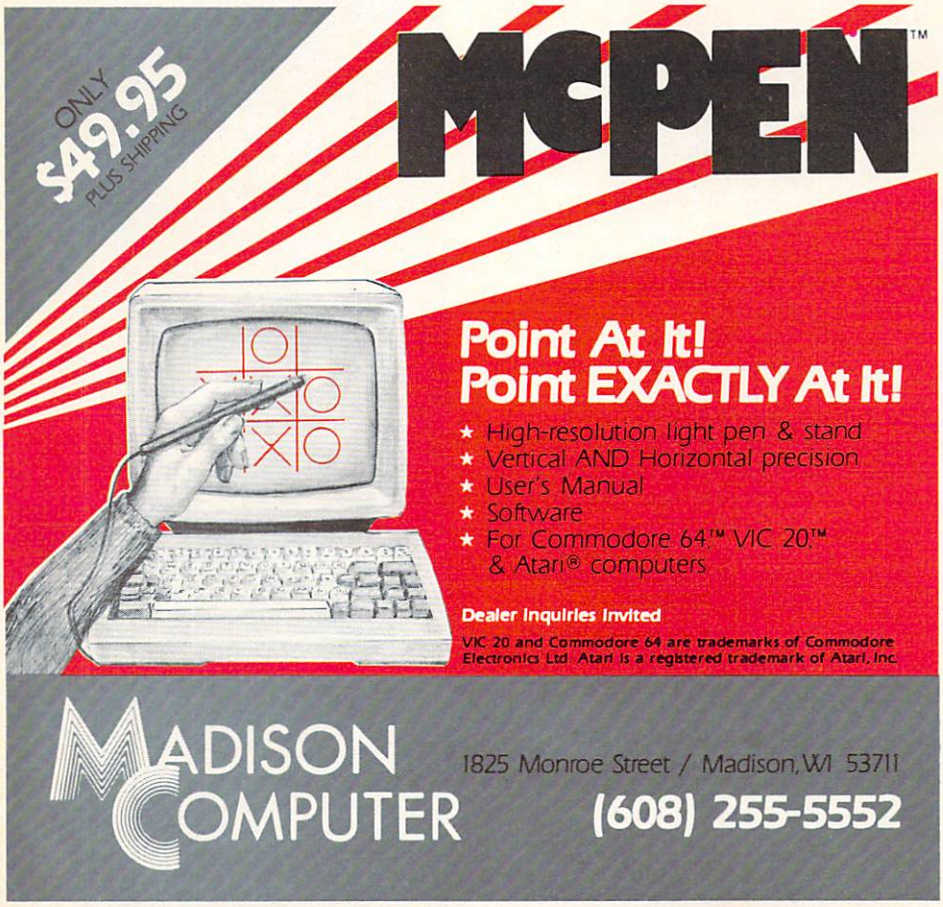
HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk). Also for Atari, Commodore, and IBM.
MANUFACTURER: Infocom
PRICE: $49.95

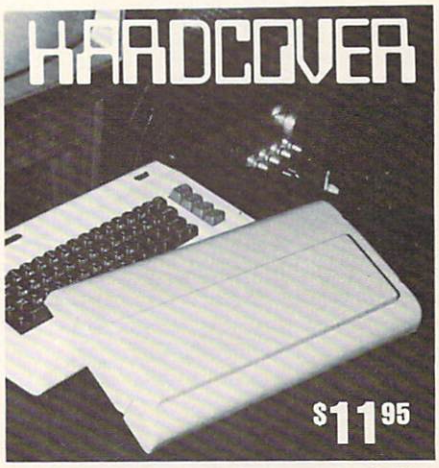
Suspended is more than just another text-only adventure. It's a complex jigsaw puzzle of riddles and clues, a time and motion test to see if you can accomplish certain tasks within a time limit. Above all, it's different. You're a brainy individual who has been cryogenically frozen. Your gray matter lives and functions while the rest of you is in a state of suspended animation. You must operate a series of computers—six highly specialized robots—that sustain human life on the planet by manipulating weather and ensuring the smooth functioning of a central computer complex.

Sound like science fiction? It is, and while you're playing you may feel as if you're about to overload your own circuits. You have to keep track of your robots, moving them around a complex of chambers, acid-dripping corridors, and other nooks and crannies of a giant scientific center. Instructed properly, your helpers can save civilization and restore the planet to normalcy.

It's a task that takes a lot of practice by players over 12 years old. Don't be surprised if you fail miserably the first few times you try it. You'll probably have to explore through trial and error. Even if you do blow it, you'll still have fun—thanks to the good sense of humor, as well as a map and playing pieces provided by Infocom inside the colorful package.

—JAMES DELSON





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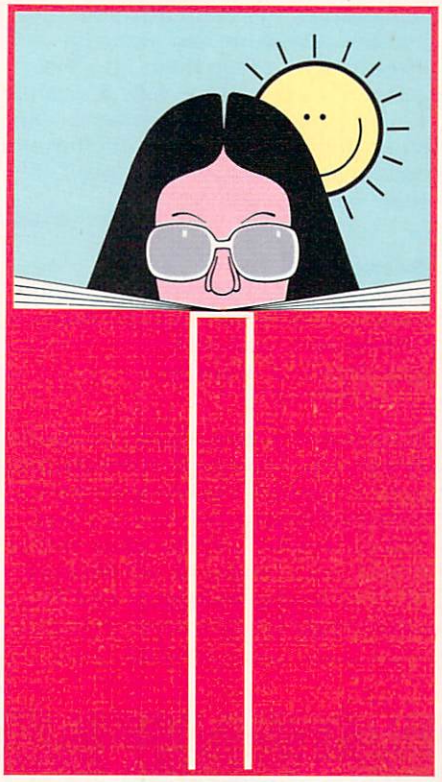

ILLUSTRATION BY EDWARD LITTLE

BY SHARON ZARDETTO AKER

Light summer reading and learning more about computers are not always mutually exclusive pursuits. Whether you lean toward fact, fun, or fiction, there's something appropriate for your night table or beach bag.

THE LIGHT SIDE

Basic computer-science facts and history masquerade as a collection of comic-strip cartoons in *The Cartoon Guide to Computer Science*. Breeze through everything from information theory to algorithms and artificial intelligence in this perfect blend of hard facts and humor.

If you're looking for laughs, and care less about the history or scientific principles behind the computer, you might turn to *The Official Computer Hater's Handbook*. Its biting, *Mad Magazine*-style satire will, like most humor, appeal to some readers and turn off others. Also, although not exactly sidesplitting, *The Naked Computer* is a witty, computer-oriented combination of the *Guinness Book of World Records* and the *Farmer's Almanac*. Read a few pages' worth of little-known facts at a time. It's good enough to last all summer.

BUT SERIOUSLY FOLKS

Tackling serious nonfiction about the computer age doesn't mean leaving easy reading behind. *Computer Wimp*, for instance, is chock-full of useful and interesting information crammed into a bright, well-illustrated volume. Filled with the personal anecdotes of someone who's learned about hardware the hard way, it's a glorified how-to-buy guide that offers both concrete advice and food for thought.

In *Electronic Life*, Michael Crichton, the best-selling author of the *Andromeda Strain*, shares his knowledge and philosophies concerning the computer. Interesting prose and an easy style rescue the book from its otherwise awkward dictionary format.

A little heavier in content, but still enjoyable to the nontechnical reader, is *The Intimate Machine*. Author Neil Frude discusses the way people view, treat, and react to machines. Although Frude focuses primarily on computers of today and tomorrow, he also examines the way people have dealt through the ages with the technological advances of their times. Kids won't find much of interest here; parents should watch out for its adult subject matter.

TALL AND NOT-SO-TALL TALES

What would summer reading be without fiction? And where would computers be without science fiction?

Even today's most sophisticated computers are fairly tame stuff com-

---

SHARON ZARDETTO AKER *frequently reviews books and software for* FAMILY COMPUTING. *Her last article was a review of the Timex 2068 in the February issue.*

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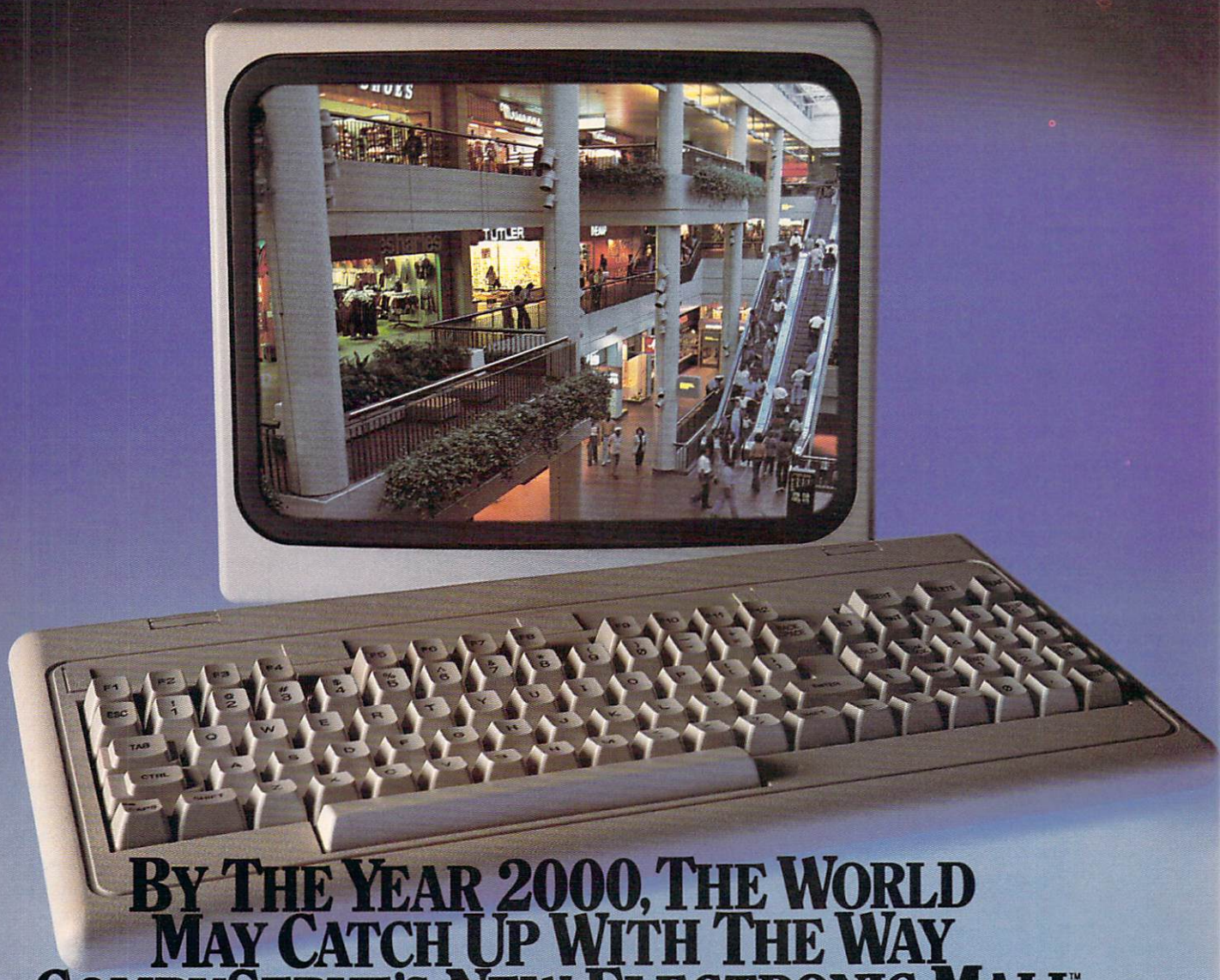

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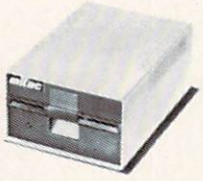

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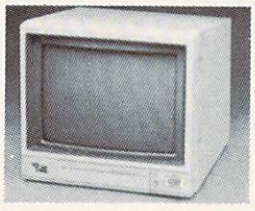

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BOOKS

pared to the ones I grew up reading about. Don't miss the classics, like *I, Robot*, Isaac Asimov's collection of short stories. Plots revolve around the conflicts that arise between people and robots and between robots and other robots.

Computer-controlled society is a popular subject among science-fiction authors. The finest treatment I've seen of that theme is *This Perfect Day*, by *Rosemary's Baby* author Ira Levin. Its hero rebels against a computer-controlled society of supposedly perfectly happy people. Eventually, he must confront the question of just who or what does the controlling in such a society. The novel is suspenseful, with several unexpected twists toward the end (as well as its share of salty language).

Michael Crichton's *Terminal Man* is about a computer-controlled individual. Suffering from violent seizures, the main character is hooked up to a computer for treatment. When the terminal man, who has long suffered from the paranoid delusion that machines are trying to take over the world, escapes, a suspense-filled manhunt ensues. Because it contains two particularly violent scenes, this otherwise fascinating blend of computer technology and psychology is best-suited to adults and mature teenagers.

Tops in the computers-in-space category is Arthur Clarke's *2010: Odyssey Two*, his sequel to the monumental *2001*. Find out what happens to the murderous computer, H.AL, and astronaut Dave Bowman. Unlike many sequels, this story can stand on its own.

A new anthology, *Machines That Think* is one of the most recent additions to my list of favorites. A number of brief essays accompany the stories, making the volume a lot more than a simple collection of tales about computers and robots. Especially noteworthy is Isaac Asimov's thoughtful introduction, in which he discusses the way science fiction has prophesied most of today's technological developments. A story written in 1934, for instance, took place in a society in which every home had a personal computer!

Whether you're stretched-out baking on sundrenched sands, curled up in a hammock in the cool shade of an elm tree, or dry and comfortable in your air-conditioned living room, these thought-provoking titles will enhance your computing knowledge and enjoyment.

SUMMER FACT, FICTION, AND FUN

Make a trip to the library, or find these books at your local bookstore. If they're not available in your area, your bookseller may be able to order them for you.

The Cartoon Guide to Computer Science, by Larry Gonick; Barnes and Noble, 1983; softcover, $5.25.

Computer Wimp, by John Bear, Ph.D.; Ten Speed Press, 1983; softcover, $9.95.

Electronic Life, by Michael Crichton; Alfred A. Knopf, Inc., 1983; hardcover, $12.95.

I, Robot, by Isaac Asimov; Ballantine Books, 1983; paperback, $2.75.

The Intimate Machine, by Neil Frude; New American Library, 1983; hardcover, $15.50.

Machines That Think, edited by Isaac Asimov; Holt, Rinehart and Winston, 1984; hardcover, $22.95.

The Naked Computer, by John Gantz and Jack B. Rochester; William Morrow and Co., 1983; hardcover, $15.95.

The Official Computer Hater's Handbook, by D.J. Arneson; Dell Publishing Co., 1983; softcover, $3.95.

The Terminal Man, by Michael Crichton; Avon Books, 1982; paperback, $2.95.

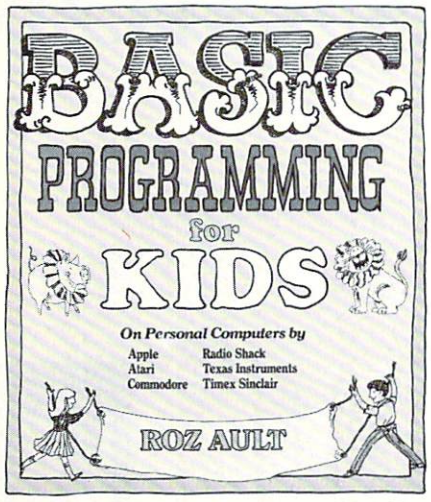
This Perfect Day, by Ira Levin; Dell Publishing Co., 1979; paperback, $2.25.

2010: Odyssey Two, by Arthur C. Clarke; Ballantine Books, 1984; paperback, $3.95.

BOOKS

BASIC Programming for Kids

Roz Ault
Houghton Mifflin Co., 1983
184 pages, softcover, $7.95;
hardcover, $12.95



If no one in your family has ever figured out what to do with the computer besides play *Donkey Kong*, I've got the book for you!

From its jolly circus-poster cover to its final appendix on how a computer works, Roz Ault's *BASIC Programming for Kids* is a delightfully painless introduction to computers and programming. You'll find brief examples that help you learn how each BASIC command works, and humorous games that demonstrate how they-fit together. Each chapter ends with a few suggestions for practice.

Some programming books can be confusing because they're written with the wrong brand of computer in mind. Here there are specific operating and programming instructions for Atari, Apple, Commodore, Radio Shack, Texas Instruments, and Timex computers. The book even includes editing and troubleshooting hints to help you eliminate the mysterious "bugs" that can plague your programs.

The chapters are intended to be read in order, but you can have fun browsing, too. My 10-year-old, who has some programming experience, went straight to the "silly letter" and "limerick" programs in Chapter 6 for an afternoon of fun without reading any of the preceding material.

Explanations are concise and graphic, without talking down to young readers. The author draws neat analogies to help illustrate aspects of programming. For example, when the program is run, she explains the computer is in effect being told, "Open every envelope with a message, in order, and follow the directions inside." Who says computer literacy has to be mysterious? What's more, who says this book's just for kids? Let's see what it says here about DATA statements.

—TAN A. SUMMERS

How to Get Intimate with Your Computer

Fred D'Ignazio
McGraw-Hill Book Co./Byte Books, 1984
154 pages, softcover, $6.95

Fred D'Ignazio was one of the first computer columnists to downplay the cause for computer literacy. You don't have to understand the way something works in order to use it effectively, Fred D'Ignazio has argued repeatedly in his computer columns. *How to Get Intimate with Your Computer* epitomizes D'Ignazio's philosophy. It stresses computer comfort, appreciation and ease of use, and leaves more technical aspects alone. While the book provides an interesting change from the usual explanations of RAM and ROM, it has some very serious problems.

First off, it's my front runner in the "too cute" category. He gets carried away with the notion of intimate. There's frequent talk of sexy-feeling keyboards and slinky, sensuous terminals.

He suggests "being left alone with your computer" as the best way to get comfortable with it. But in reality, people need other people to help break the barriers to computer comfort. Two minutes under a friend's tutelage can avoid months of needless agony. The latter portion of the book endorses various software programs, although not every program D'Ignazio "loves" is available on every machine.

I admire Fred D'Ignazio's magazine columns a great deal, but he went a little too far with this book. I'll never sit down and type "I think you're cute" to my favorite computer. I'll keep my computer as a tool and a workhorse, and go elsewhere when I need a friend and confidant.

—ROBIN RASKIN

MIND AT PLAY: The Psychology of Video Games

Geoffrey R. and Elizabeth F. Loftus
Basic Books, 1983
191 pages, hardcover, $14.95

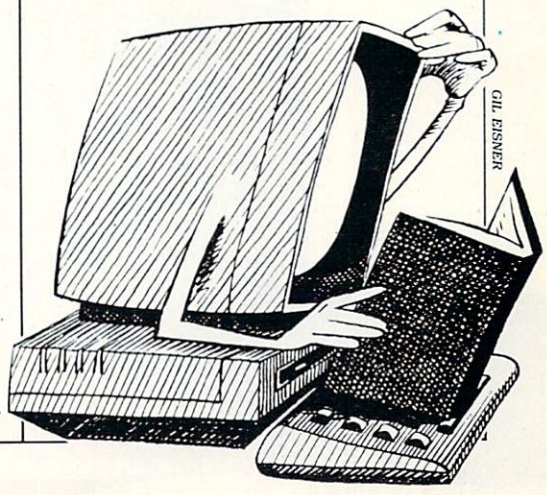
At least $5 billion in quarters will find their way into video game slots across America this year. An equal amount will be spent on home video games and their peripherals. Whether you love 'em or hate 'em, there's a lot more to these games and their use than meets the eye! *MIND AT PLAY: The Psychology of Video Games*, by psychologists Geoffrey and Elizabeth Loftus, takes us behind the screens for a deeper look at the video game craze.

The questions discussed are important ones. Why are video games fundamentally different from all other games? Who plays video games? What sort of mental and physical skills do they cultivate? Can video games transform education? The answers are substantiated with well-documented research and carefully drawn conclusions.

For those of us unfamiliar or far away from textbook definitions of memory and attention span, or from learning reinforcement theories picked up in Psych 101, the Loftuses offer clear, comprehensive explanations. They simplify complex subjects and offer good illustrative material.

The video game phenomenon is beginning to generate a substantial amount of academic research. This book is the first I've seen to collect the information into a readable essay. You'll learn about video games, psychological learning theories, and something about yourself, too.

—ROBIN RASKIN



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The new Apple® IIc Personal Computer.

It's 12″ x 11¼″ x 2¼″.

It weighs less than 8 pounds.*

And costs less than $1,300.**

Yet what it can do is all out of proportion to these proportions.

It's a direct descendant of the world's most popular personal computer, the Apple IIe.

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And it can do all that right out of the box.

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And built-in connections that let you add printers, phone modems and an extra disk drive without adding $150 goodies called "interface cards."

Two views of the IIc, shown here with its perfect match—the IIc 9″ Monitor.

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In fact, the Apple IIc can run more educational and business software than any other computer save one: the Apple IIe.

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You'll find it's a lot bigger than it looks.

*Don't asterisks make you suspicious as all get-out? Well, all this one means is that the IIc alone weighs 7.5 pounds. The power pack, monitor, an extra disk drive, a printer and several bricks will make the IIc weigh more. Our lawyers were concerned that you might not be able to figure this out for yourself. **The FTC is concerned about price-fixing. So this is only a Suggested Retail Price. You can pay more if you really want to. Or less. © 1984 Apple Computer, Inc. Apple, the Apple logo and MousePaint are trademarks of Apple Computer, Inc. For an authorized Apple dealer nearest you, call (800) 538-9696. In Canada, call (800) 268-7796 or (800) 268-7637.*

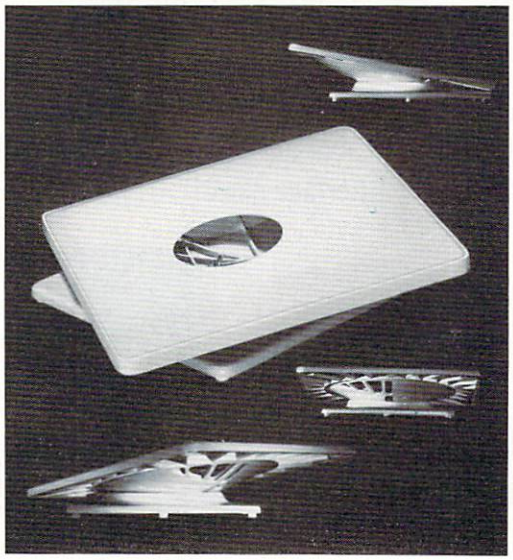
PHOTOGRAPH BY GARY KANE

ROM GARDEN

Add life to your computing work area with this computer planter. The plastic planter has a space for a small plant, and an insert for a photo of a computing friend or true love. Order the container for $11.99 from CompuGift, Inc., 27802 Perales St., Mission Viejo, CA 92692; (714) 768-8223.

PHOTOGRAPH BY GARY KANE

NOVELTIES & NOTIONS



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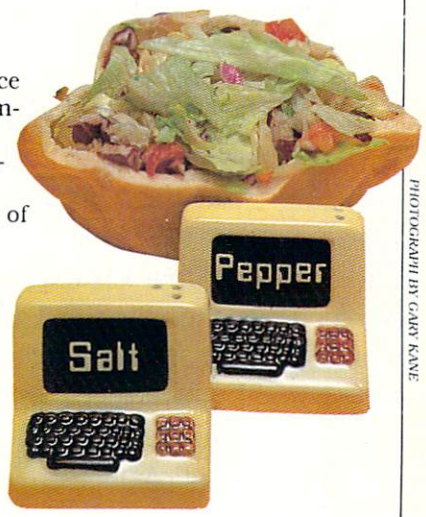
This tilt-and-swivel monitor stand will keep both you and your monitor in tip-top shape. As the UNI-1 helps reduce back tension and eyestrain, it also provides ventilation to keep your monitor cool. The 2-inch high UNI-1 supports any monitor whose feet fit on a 13-inch square base. The tilt-and-swivel base costs $49.95 and can be purchased at computer dealers. Curtis Manufacturing, 305 Union St., Peterborough, NH 03458; (603) 924-7803.

COMPUTERS IN SEASON

Add a little computer spice to the kitchen. These computer terminal salt- and peppershakers are practical novelties for anyone with hi-tech tastes. A set of ceramic shakers costs $12.98 and can be purchased from Taylor Gifts, 355 E. Conestoga Road, Box 206, Wayne, PA 19087; (215) 293-9306.



PHOTOGRAPH BY GARY KANE

SWEET SOFTWARE

This disk will sweeten any computer user's day, and it's compatible with all brands of micros. Give this ¼-pound chocolate treat to one of your favorite computer buffs, or hide it for yourself. ChocWare chocolate disks cost $5.50 plus postage and handling, and are available from Hi-Tech Choc, 350 Sharon Park Drive G24, Menlo Park, CA 94025; (415) 854-CHOC.

THE PRIMER

The Primer will appear in every issue of FAMILY COMPUTING. You might look to it for "Everything You Always Wanted to Know About Computers but Were Afraid to Ask." New information will be presented periodically, and existing sections will continually be adapted and updated. Whatever the format, the Primer is a handy reference guide to shopping for, setting up, and using a computer.

The only way to learn to use a computer is to use one. But before you start, it's well worth asking, "What can I do with a computer?" And, "How does a computer work?"

The illustration of a computer system on the opposite page shows various pieces of equipment, referred to as hardware. To work effectively, this hardware needs step-by-step instructions, or programs. These programs are often called software. What you can do with a computer depends on the software you use.

The many uses of home computers can be broken down into several broad categories.

WHAT A COMPUTER DOES

Game Playing. Several types of games are available—arcade-style action, fantasy, adventure. Some take minutes to master; others months. Many games can be played by more than one person at a time.

Education. Whether you are learning math, French, history, or typing, these programs allow you to learn at your own pace. Programs range from question-and-answer drills to loose creative exercises. Some test logical skills, by putting you in a real-life problem-solving situation; others teach you to program by letting you draw pictures.

Paper work. When it comes to handling reams of information, the computer can't be beat. It functions as an endless supply of paper, file cabinets, and a calculator rolled into one. With an electronic spreadsheet, you can change one figure in a budget and the rest will automatically change. The ability to ask "what if?" and see immediate results has obvious time-saving benefits.

The computer is equally adept at setting up a filing system, and allows you to cross-reference data in any number of ways for easy recall.

With a word-processing program, the computer can speed up and simplify the writing process, by allowing you to change or rearrange words and paragraphs without retyping.

Information access. You can hook your home computer, via the telephone, to much larger computers at "information service" companies. This allows you to "call up" stock quotations, airline schedules, newspaper and magazine bibliographies, encyclopedias, and even games.

Also, by using the telephone lines you can hook your computer to other home computers around the country, and leave or receive messages. This practice is known as electronic mail. Several computers linked together are called a network.

Programming. It's possible to enjoy practical benefits from your computer without ever buying a commercial program—you can write your own. And, in some cases, you can adapt commercial programs to better suit your particular needs.

HOW A COMPUTER WORKS

The computer is an information-handling machine. It stores, compares, changes, and manipulates information of almost any kind at tremendously high speeds.

The computer's operating method can be boiled down to four simple steps. (1) INPUT: Instructions and information, in the form of a program and data, are entered into the computer. (2) PROCESSING: The computer executes the steps of the program. (3) OUTPUT: The results of the computer's work are made visible and available to the user. (4) STORAGE: Results can be stored and saved.

Most home computers do not come ready-made in one piece, but must be assembled from various components. Following are the components needed for each of the four operating steps, and how they work.

Input. There are four basic ways of getting a program and/or other information into a home computer.

KEYBOARD. The keyboard looks and behaves much like that of a typewriter. Some keyboards have special keys for certain computer functions, and some have a numeric keypad, much like a calculator. But on any unit, every keystroke you type goes directly into the computer's memory. That information will stay there until you delete it or turn the computer off. (You can also store, or save, that information for future use.)

CASSETTE TAPE RECORDER. You can copy a program stored on a cassette tape directly into the computer's memory. Regular tape recorders and cassettes can be used with most home computers, although you will need a special cable to connect the two. Once connected, you merely type a simple command to transfer the program from tape to computer.

DISK DRIVE. The transfer method is much the same with a disk drive, except that the program is stored on a floppy disk, which looks much like a 45 rpm record.

The disk drive enters programs much more quickly and with less chance of error than the cassette recorder. But the cassette recorder is significantly cheaper.

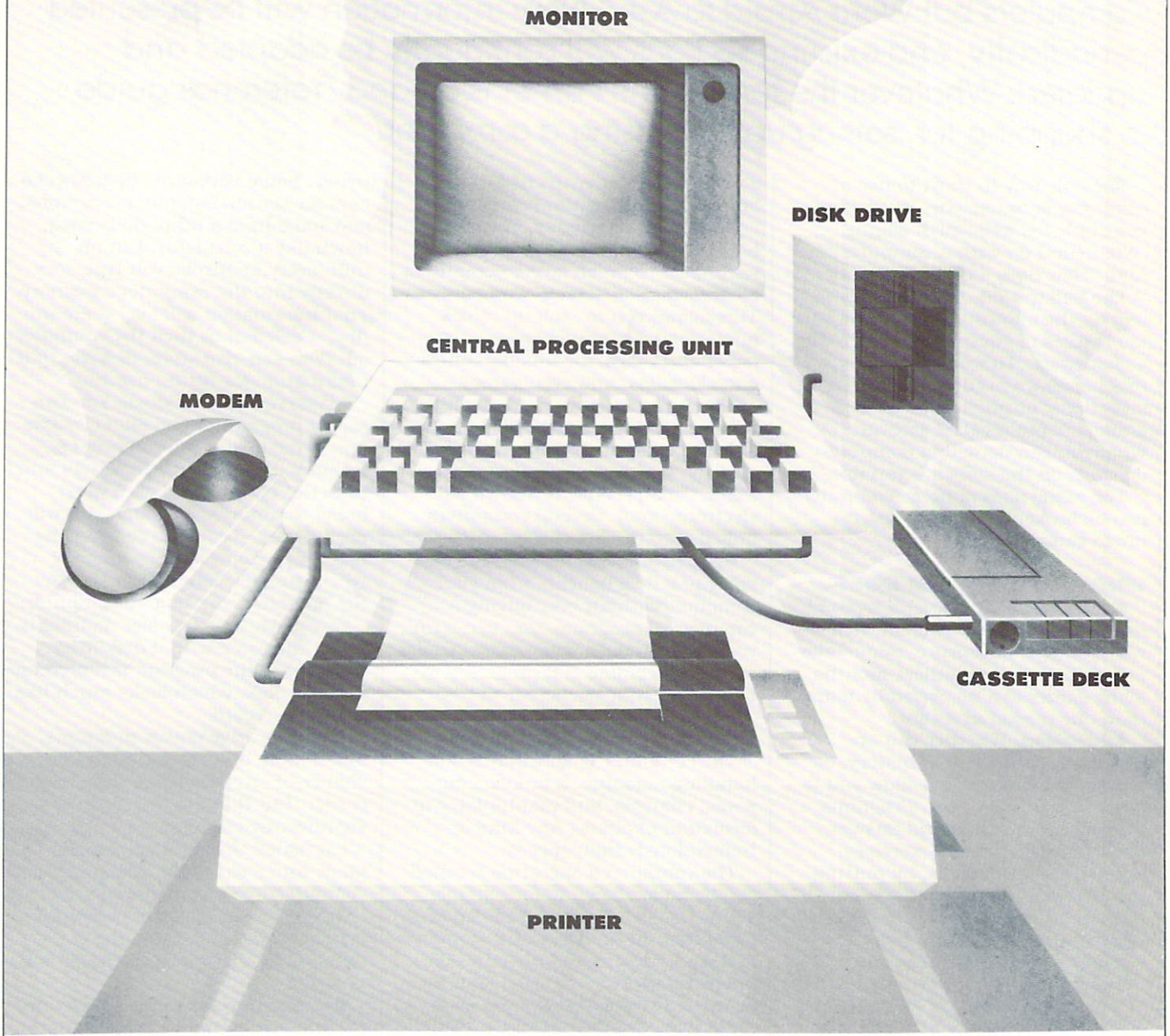
CARTRIDGE. A cartridge, which plugs into a slot built into some computers, also stores programs. Putting a cartridge into a computer actually adds memory to the computer—and that memory contains a program.

Processing. All input goes to the Central Processing Unit (CPU), located underneath the keyboard. The CPU is a maze of tiny electronic circuits, but it functions as a giant.

The CPU controls the flow of information into, out of, and inside the computer. The computer's memory, where information is stored, is located in the CPU. The CPU also interprets a program, performs each of its steps, and then sends the results to the user.

Output. The visible result of a CPU's work is called output. Output is made available on the screen of a

THE COMPONENTS



TV or monitor, or from a printer.

Computers can be hooked to TVs or monitors, and to printers. In all cases special cables are required. In general, the monitor's screen display is sharper than the TV's.

Storage. When the computer is turned on, it will store and remember all information it receives. But when it is turned off, this information will vanish—unless you instruct the computer to save it.

You can store information on a blank tape or disk. Either way, you can record the results of the computer's work, just as you would record a speech. Then, any time you want to run that program again, you can transfer it into the computer's memory, and see it on the display screen.

You cannot store new information on a cartridge.

Peripherals. Peripherals are optional pieces of equipment that can be added to your computer, but are not crucial to the computer's operation. A printer, in fact, is considered a peripheral. One of the most popular peripherals is a modem.

MODEM. If you want to link your computer to an information service or other computers, you will need a modem. A modem holds a telephone receiver and transmits and receives data through phone lines.

Remember that the computer is a tool. As with all tools and machines, there is no need to know everything about how a computer works. All you need to know is how to use it for your own purposes.

ILLUSTRATIONS BY RICHARD TIMPERIO

THE PRIMER
THE WORDS

The Words is a glossary of commonly used computer terms. Some are well-known English words, such as *read* and *write*, that have been incorporated into computer language and given different meanings. (Note: All italicized words in the definitions are defined in full elsewhere in the glossary.) Other terms that refer to a computer's inner workings are not often used in common speech, but are important because they are used in manufacturers' specifications and ads. Don't be awed by them. Remember the delight with which Americans took to the new NASA language over 20 years ago, when John Glenn first orbited the globe.

Access
To retrieve *data* from a storage place in the computer system. Access time is the amount of time it takes to obtain the *data*. Also refers to the action of connecting a terminal to a remote computer, as in: "I use my computer to access CompuServe."

Address
A specific location in the computer's *memory* where a piece of information is stored. Each address is identified by a number.

Bank-switching
The ability of a computer's *microprocessor* to address two *memory* banks, though not at the same time. For example, some 64K *RAM* computers can use bank-switching to *access* 128K *RAM*, but only 64K at a time. Bank-switching allows you to run more powerful *software*, and gives you a larger "work space" in *memory*.

BASIC
Beginner's All-purpose Symbolic Instruction Code. A popular, easy-to-learn *programming language* widely used with microcomputers.

Baud
Bits per second. A unit of measurement that describes the rate at which *data* are transmitted from one device to another, such as computer to printer, or computer to computer.

Bit
The smallest unit of information a computer uses. A bit is either the digit "0" or "1." An "eight bit" processor manipulates *data* in clusters of eight bits.

Board
Printed circuit board. A flat, thin, rectangular component of a computer that includes one or more layers of printed circuitry to which *chips* and other electronic parts are attached. As an add-on to an existing computer, sometimes called a card.

Boot
Derived from "bootstrap." To start or restart a computer system by *reading* instructions from a storage device into the computer's *memory*.

Buffer
A temporary storage area to hold *data* during a transfer from one part of a computer system to another. The buffer may be in the computer, in the *peripheral* device, or it may be a separate, stand-alone unit.

Bug
An error in the logic of a computer *program* that prevents it from running properly. Bugs can cause a program to "freeze up," that is, to repeat the same operation endlessly. Finding and correcting the error is called debugging.

Bulletin board
An area, reached by dialing a remote computer system via *modem*, where you can leave or read messages electronically. Bulletin boards are usually set up on computers in people's homes, or at information services such as The Source or CompuServe.

Byte
One byte contains eight *bits*, enough to stand for one character of English, or one number. Thus, it generally takes more than one byte to make up a word. "Cat," for instance, requires three bytes.

CAI
Computer-Assisted Instruction. A term applied to a wide range of instructional *software*, including drill-and-practice, simulation, and educational games.

Chip
A small component (about the size of a child's fingernail) that contains a large amount of electronic circuitry. Chips are the building blocks of a computer and perform various functions, such as doing arithmetic, serving as the computer's *memory*, or controlling other chips.

Compatibility
The ability of different devices, such as a computer and a printer, to work together; or the ability of a particular *program* to run on a given computer. In short, the ability of anything in a computer system to work with anything else.

CPU
Central Processing Unit. The "heart" of a computer, with components that control the interpretation and execution of instructions.

CRT
Cathode-Ray Tube. A TV or TV-like monitor used to display information and pictures. Also called a computer screen.

Cursor
A moveable symbol, usually a flashing square, that indicates where the next character will appear on the *CRT* screen.

Daisy-wheel printer
A printer that produces fully formed letters with an impact mechanism, which is a daisy-shaped wheel with raised characters on individual "petals." The output is comparable to that of a good typewriter. Sometimes called "letter-quality," these printers are generally slower than *dot-matrix printers*.

Data
Information put into or taken out of a computer.

Data-base manager
A *program* that allows the user to enter, organize, sort, and retrieve information.

Disk
A magnetic device for storing information and *programs* accessible by a computer. A disk can be either a rigid platter (hard disk) or a sheet of flexible plastic (floppy disk).

Disk drive
A device that *reads* information from a *disk* and copies it into the computer's *memory* so that it can be used by the computer, and that *writes* information from the computer's *memory* onto a *disk* so that it can be stored.

Documentation
The written instructions that explain how to use computer *hardware* or *software*. Also refers to all instructions and remarks used to describe procedures when *programming*.

DOS
Disk Operating System. See *operating system*.

Dot-matrix printer
A printer that forms letters from a rectangular arrangement of dots. The more dots in the matrix (9 × 24, for instance), the better the letter formation. Dot-matrix printers are very fast and versatile, affording a choice of many type and print styles.

Though there are two types of dot-matrix printers—impact and *thermal*—the term is generally used to refer to the impact type. See *thermal printer*.

Download
To receive a *file* from a remote computer system. Opposite of *upload*.

Electronic mail
The transmission of messages, documents, or other information from one computer user to another. This can be done over telephone lines using devices called *modems*.

File
A collection of *data* stored as a named unit.

Flow chart
A diagram on paper that shows all the logical steps necessary to write a *program*.

Format
To prepare a *disk* so that it can receive and store information. Until you perform this task, the *disk* will not be able to store any information. The word "initialize" is often used to mean the same thing as format.

Freeware
Software that can be used and copied without charge. However, freeware is copyrighted, and the copyright holder generally asks that the user send a donation if the *software* is to be used regularly. See *public domain software*.

Full-duplex
A *modem* setting that allows a computer to both transmit and receive *data* at the same time. When two computers communicate and both are operating in full-duplex, the resultant "echo" effect allows you to see on your video

THE PRIMER/THE WORDS

display exactly what the remote computer has received.

Function key
A special key on the computer's keyboard that has been or can be designated to perform a specific task.

Graphics tablet
A kind of electronic drawing board. With a graphics tablet and a special pen, whatever you draw will appear simultaneously on the *CRT*.

Half-duplex
A *modem* setting that allows a computer to either transmit or receive *data*, but not to do both at the same time (like a CB radio).

Hard copy
Information printed by the computer onto paper.

Hardware
The physical, nonchanging parts of a computer system. Contrasted with *software*, or *programs*, which can change.

Information services
Broad-based *data bases* that offer a variety of services, ranging from airline reservation information to stock market quotations. You need a *modem* to link up with such a service.

Input
Programs or *data* entered into the computer.

Interface
An electronic connector between two parts of a computer system.

K
Abbreviation for kilo*byte*. Used to describe the amount of *memory*, or storage space, a computer has; it signifies 1,024 *bytes*. A computer with 16K of *memory*, for example, can store 16,384 *characters* of information at one time.

Logo
An educational *programming language* that allows the user to draw pictures on the screen. Logo is particularly good for teaching young children how to *program*.

Machine language
A binary code consisting of "0s" and "1s," which is the only language a computer understands. *Programs* written in any other language, such as *BASIC*, are translated by the computer into machine language for processing.

Memory
The place in a computer where *data* and *programs* are stored.

Microprocessor
A tiny processor on a single *chip*. The "brains" of all microcomputers, it is also found in many consumer products.

Modem
A contraction of Modulator/Demodulator. A device that makes it possible to transmit and receive computer *data* over telephone lines.

Monochrome monitor
A type of monitor that can display only one color on a black background. They come in either white, green, or amber.

Mouse
A small device, connected by cable (its tail) to the computer, that can be moved around on a flat surface to cause a corresponding movement of a *cursor* or arrow on the monitor. By clicking a button on the mouse, the user can choose or implement functions, such as EDIT or PRINT, from a *menu*.

Operating system
A built-in *program* that controls the operation of a computer system, such as controlling signals to the *disk drive* or printer. When a computer system is turned on, the operating system is the first *program* executed. All subsequent *programs* are *loaded* and supervised by the operating system.

Originate/answer
Refers to the two basic modes required for communication via *modem*. When two computers linked to *modems* establish connections, one *modem* must be in the originate mode (the caller), and the other must be in the answer mode.

Output
Computer-generated information that is transferred to a monitor, *disk*, tape, or printer.

Parallel interface
An interface between two parts of a computer system, most often a computer and a printer, that transmits *data* eight *bits* (one *byte*) at a time, along separate, "parallel" wires. See *serial interface*.

Pascal
A *programming language* that can be used on many microcomputers. While it is considered more difficult to learn than *BASIC*, it can generate *programs* that run faster and use less *memory*.

Peripherals
Hardware accessories for a computer, such as a *disk drive*, printer, or *modem*.

Piracy
The unauthorized copying of copyrighted *software*.

Pixel
Stands for "picture element." A single dot of light on a TV screen or computer monitor. These tiny elements are used to create electronic pictures, or graphics.

Plotter
A machine, attached to a computer, that prints lines or graphs on paper.

Port
A "female" socket on a computer where you can plug in *peripherals*, such as a printer or *modem*.

Program
A set of step-by-step instructions that tells a computer how to solve a given problem. Also, to prepare such a set of instructions.

Programming language
A language, with clearly defined rules, that can be used to express a computer *program*.

Public domain software
Software that is not copyrighted and can thus be used and distributed freely. See *freeware*.

RAM
Random Access Memory. An area in the computer where information is stored. When called into this area, information can be changed, or edited. However, it will be lost when the computer's power is turned off, unless you first *save* the information.

Read
The process of copying information from a storage device (such as floppy *disk* or tape) into the computer's *memory*. Reading only copies, it does not erase the *data* from where it is stored.

Resolution
The sharpness of a picture on a *CRT*, usually described as "high" or "low." The higher the resolution, the sharper the picture. Resolution is expressed by the number of *pixels* in the display. For example, 512 × 342 is much sharper than 320 × 192.

RGB monitor
Red-Green-Blue. A color monitor that achieves a superior display by using three color beams instead of one (as regular "composite" color monitors do).

ROM
Read Only Memory. Permanent *memory* built into a computer by a manufacturer. The information stored here gives the computer operating instructions when it is first turned on. The user cannot change this *memory*.

Save
To store information from *memory* on tape or *disk* so that it can be used again.

Serial interface
An *interface* between two parts of a computer system that transmits *data* one *bit* at a time. Slower than a *parallel interface*.

SIG
Special Interest Group. A fraction of a larger group, such as a users' group, made up of members with common interests, e.g., a Stocks & Bonds SIG.

Software
Computer *programs*. Also, tapes and *disks*.

Sprites
Small, high-resolution objects that can be moved independently of other text or graphics on the monitor. They can change color and size and move in front of or behind other objects on the monitor. Used to create animated sequences. Called "players" and "missiles" on Atari computers.

Terminal software
Used in conjunction with a *modem*, this type of *software* is necessary to communicate with other computers and perform various functions, such as *upload* and *download data*.

Thermal printer
A type of *dot-matrix printer* that works by "burning" dots into heat-sensitive paper. The printer is extremely quiet and does not require ribbons; the paper, however, is expensive and can be hard to find.

Upload
To transmit a *file* from your computer, via *modem*, to another computer.

Word processor
A *program* that allows the user to write, edit, or rewrite text. The text can be *saved* on a storage device and printed out. A word processor allows the user to make changes in the same text without retyping the whole page.

Write
The opposite of *read*. To transfer information from the computer's *memory* to a storage device such as a floppy *disk*. Write-protect is a procedure for preventing new information from being added to a *disk*.

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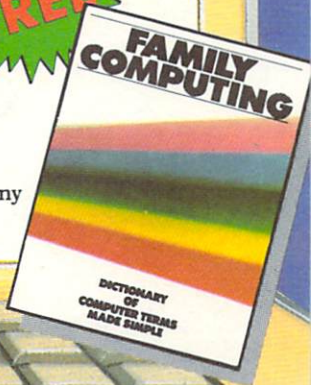

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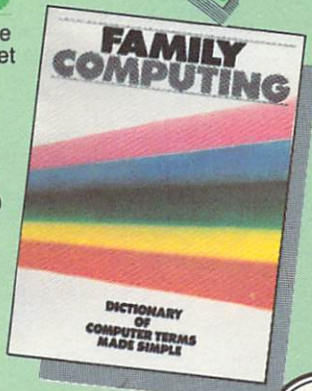

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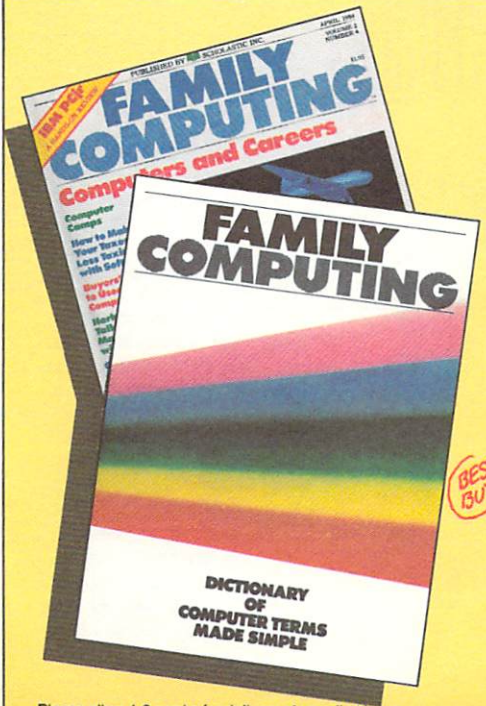

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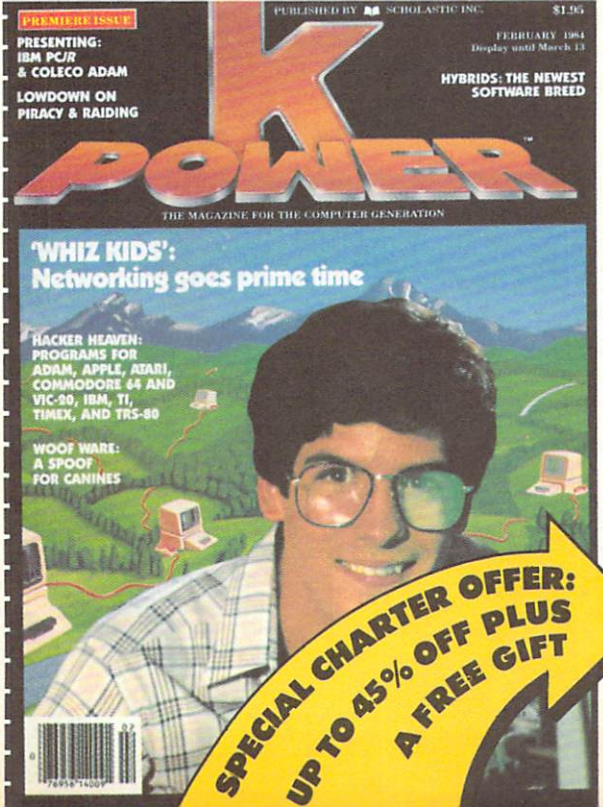

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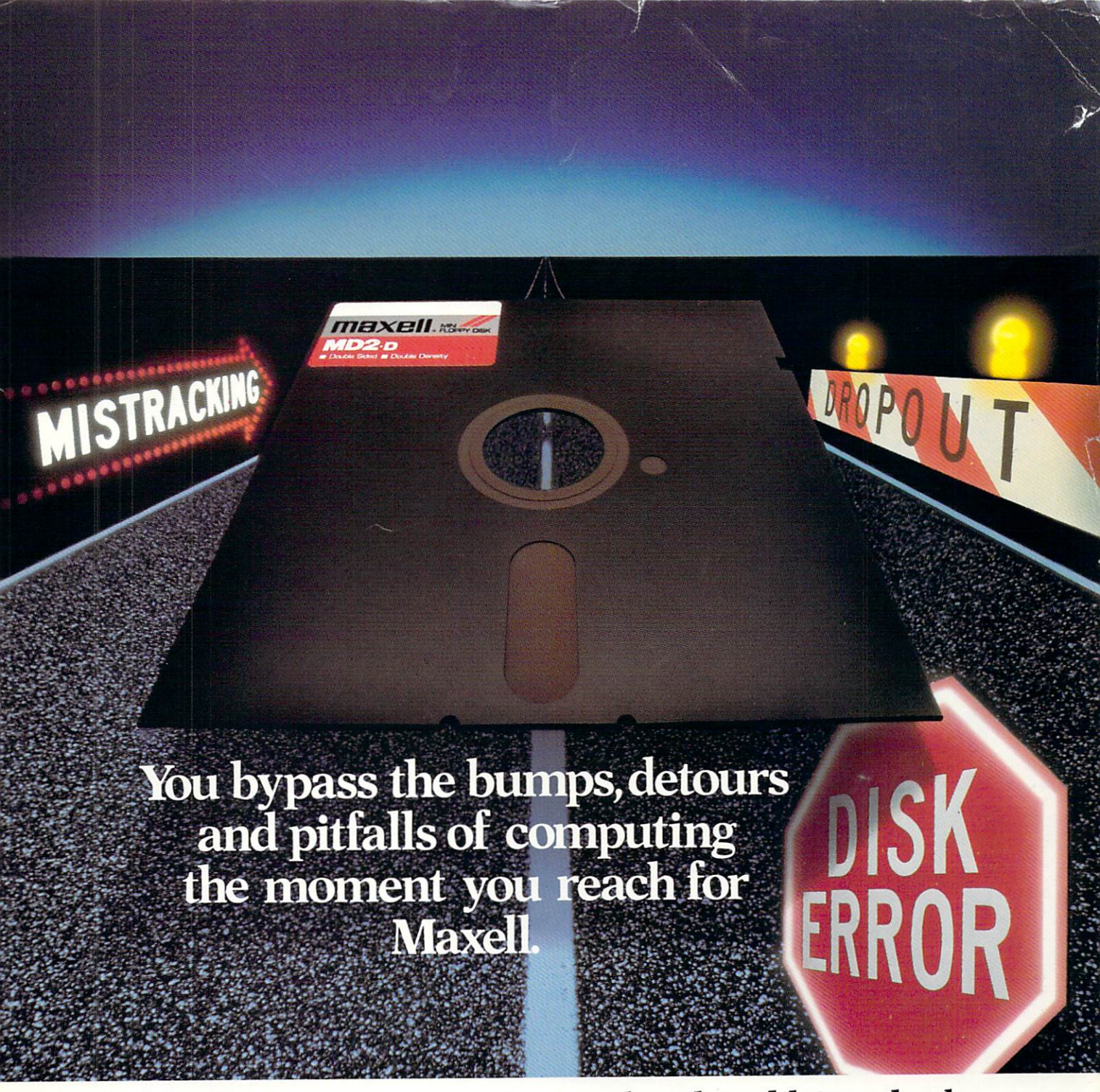

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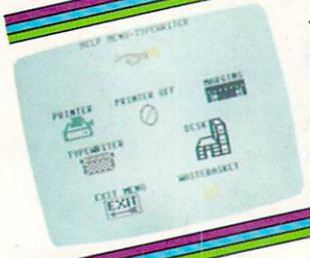

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